An information bulletin on Non-Wood Forest Products

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EDITORIAL

Welcome to the twentieth issue of *Non-Wood News*. This anniversary provides us not only with an opportunity to reflect on what has happened in the world of Non-Wood Forest Products (NWFPs) since the first issue of *Non-Wood News* was published in 1994, but also gives us a chance to look towards the future.

Over the years, *Non-Wood News* has proved to be a unique vehicle through which to share with you the most recent thinking and information on NWFP-related activities around the globe. We have consistently highlighted the growing *potential* of NWFPs, which we believe is reflected in this issue – another issue full of the ideas, initiatives and research of our growing group of readers.

Dr C. Chandrasekharan, the founder of this newsletter, fully recognized the significant role of NWFPs in addressing the food security and health needs of many rural and forest-dependent populations. With over one billion people suffering from hunger in the world today, NWFPs provide a significant safety net. One of the Special Features in the present issue focuses on this important role and presents a broad picture of how a variety of different NWFPs (plants and ferns, nuts, mushrooms, berries, honey and edible insects) are alleviating malnutrition and improving diets for many people, as well as meeting their health care needs. Our NWFP Programme is at present looking into the growing potential of edible insects with the aim of "rediscovering" them and raising awareness about them as an excellent source of protein for both humans and livestock.

A recent new aspect of *Non-Wood News* has been the inclusion of a guest article written by a leading scientist. This issue's guest article has been written by Dr Antonio Brunori, who specifically looks at the huge *potential* for novel uses of NWFPs. Recent research in his native Italy has led Dr Brunori to uncover a hidden world of NWFPs. His article highlights the potential of applying creativity to a variety of NWFPs to produce innovative and marketable products, such as cloth from cork, or medicines from the slime of forest snails.

NWFPs have a huge *potential* for health care. Traditional medicine relies predominantly on medicinal plants and herbs, but breakthroughs have occurred with the discovery of medicinal properties in other NWFPs, such as the use of honey in wound dressings and to fight bacteria, and the cancer-fighting properties of mushrooms. In addition, the multimillion-dollar pharmaceutical industry bases much of its research on medicinal plants and their traditional uses. Our section on bioprospecting/biopiracy (another regular feature over the years), shows how countries, recognizing the enormous economic potential

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is compiled and coordinated by Tina Etherington, Forest Products and Industries Team of FAO's Forest Economics, Policy and Products Division. For this issue, editing support was provided by Giulia Muir; copy and language editing by Roberta Mitchell, Josiane Bonomi and Deliana Fanego; 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 15 May 2010, to: NON-WOOD NEWS – FOEI
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involved, are now taking steps to protect their traditional knowledge through patents and digital libraries.

The second Special Feature highlights the *potential* of bamboo within the climate change debate. Bamboo has often been called the "poor man's timber"; in his article, however, Jukka Tissari argues that bamboo has further potential to become the "poor man's carbon credits". Moreover, bamboo has the *potential* to provide emergency housing during natural disasters.

There is also a growing *potential* to engage modern technological tools to safeguard biodiversity as can be seen from articles in this issue ranging from the use of Google Earth images by indigenous tribes in the Amazon to protecting forests with barcodes.

Finally, we would like to thank you for your many e-mails of encouragement and support, and also for generously sharing your research, sending us news from your countries, or informing us of meetings you are organizing. We have greatly benefited over the years from you, our readers.

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.

HOW CAN WE SHED LIGHT ON THE HIDDEN WORLD OF NWFPS? SOME IDEAS FROM ITALY

Developing the Italian Sustainable Forest Management certification scheme since 2001 has made me realize just how important NWFPs are for rural and forest communities, in some areas much more than timber production itself. In many mountain areas, the economic aspect of chestnut production, truffle harvesting and mushroom picking, as well as hunting for large mammals or wild pigs, and further development opportunities linked to NWFP recreational activities, is still the most important factor supporting the income of forest owners and the welfare of rural populations in such marginal areas, especially in those mountain areas covered by coppice forests.

Yet, in the first years of the Programme for the Endorsement of Forest Certification (PEFC) schemes, the only forest products considered by the certification schemes were wood and cork. However, as soon as the Pan-European scheme became worldwide and the application field was enlarged – shifting from "wood certification" to "forest-derived products certification" – I began to work, together with Australian, Chilean, Brazilian, French, Spanish and Portuguese national PEFC schemes, to give NWFPs their proper place (on the same level as wood products) in the forest certification scenario.

The good examples from Forest Stewardship Council (FSC) certification found in Brazil (gum rubber from the gum tree and cashew nuts); Nepal (essential oils and aromatic herbs); Scotland, United Kingdom (venison) and, most recently (2008), bamboo in China and gin from the green pine cones of *Pinus sylvestris* in Belgium confirmed what we were proposing to the scheme itself, as well as to forest owners, forest managers and stakeholders. Consequently, in 2007 the PEFC system formalized the opportunity for NWFPs to be certified.

In the meantime, I had the opportunity to start collaborating with Dr Gian Antonio Battistel (of the Istituto Agrario di San Michele all'Adige, now Fondazione Edmund Mach, of Trento [Italy]) to undertake a national survey on NWFPs, financed by the Italian Ministry of Agricultural and Forest Policies. With this initiative, my love and surprise for this "hidden" world of NWFPs reached its highest point. We wanted to have confirmation of a feeling that NWFPs are more than just truffles and chestnuts, fungi and forest fruits. What we systematically found out, through a market survey first and field research afterwards, was incredible: we saw how much imagination was shown by forest owners and managers, and also how many applications such simple forest products can have.

Below are some of the most interesting and fascinating examples of the promotion and ingenious use of NWFPs in Italy.

Medicines from snails

In the region of Lazio we met an entrepreneur who produced phytotherapic products and who was now promoting snail products. Indeed, the land helix (*Helix pomatia* L.), or snail, has been used in medicine since antiquity and prepared according to several different formulae. The understanding of a snail's medicinal properties began during the time of Hippocrates (who proposed the use of snail mucus against protoccle), Pliny (who thought that the snail increased the speed of child delivery and was "a sovereign remedy to treat pain related to burns, abscesses and other wounds") and Galien (who recommended snails against *Hydrops foetails*).

The traditional use of snails for medicinal purposes had prompted this Italian entrepreneur to create snail-slime-based products (*mucus helicis pomatiae*), such as syrups and skin creams. The active ingredients of snail slime are elicina and mucina, which this manufacturer of phytotherapy products extracts through exclusive and innovative techniques that preserve their healing properties. The snail's syrup can alleviate annoying coughs and ulcers, while the slime-based cream relieves discomfort from acne, improves healing of wounds and smoothes wrinkles.

Only forest snails in the wild contain high levels of these active principles. Therefore, the snails are harvested in state-owned forests, mainly in high mountain areas that are uncontaminated and rich in aromatic herbs.

Fabric made of cork

On the island of Sardinia we met a lady who has created an innovative fabric made of tree bark extracted from the cork oak tree (*Quercus suber* L.). This kind of tree has its ideal habitat in the Mediterranean area and one of the highest qualities of cork can be found in Sardinia. Through a series of long and demanding phases, and after years of seasoning and sorting out the best kinds, the cork is treated and processed to produce a fabric and yarn. This process involves pressing the cork into thin sheets (of a few tenths of a millimetre) and then binding them to a backing (which may vary from cotton to viscose and silk), and subsequently subjecting them to a particular treatment involving the use of natural substances. It is a unique product, covered by patent protection in a large number of countries since 1999, and has the brand label of Suberis®.

This cloth is, basically, a revolutionary material: its perfect fusion between technology, creativity and nature has resulted in a fibre as light as silk and as soft as velvet, but at the same time that is stain-resistant, anti-mite, scratch-resistant, waterproof and fireproof ... practically indestructible.

According to some professionals in the sector, cork cloth may end up replacing animal leather. In fact, some have already nicknamed it "vegetable leather", although it is in fact cheaper and more ecological than real leather. This fabric is used to produce clothes (jackets, trousers), accessories (bags, umbrellas, belts, bags), in furniture making (covers for chairs, armchairs and sofas) and in interior design.

The ancient "manna" gets a modern shape

On the island of Sicily we went looking for the South European flowering ash (*Fraxinus ornus* Linn.), a small tree that yields from its bark a sugary sap called manna. The term "manna" is extremely old and is applied to the saccharine exudence of a number of plants, e.g. *Quercus persica* (oak manna), *Alhagi maurorum* (camelthorn), *Tamarix gallica* var. *mannifera* (tamarisk manna) and *Larix decidua* (Briançon manna).

The history of manna is pieced together with historical references from the Bible, health manuals from ancient civilizations and references to the implements used to harvest it. Its medicinal qualities include its mild laxative effect and its natural sweetness for dietary purposes; its use in digestive alcoholic drinks and cosmetics has also been noted. It is sold locally at pharmacies and tobacco stores but, because of its biblical name and its wide range of medicinal uses, there are some commercial channels opening elsewhere.

Since Roman times, during the dry and warm season, the sap flows through a gash made with a special technique. Using a curved cutter on the vein of the tree trunk, the manna is left to drip for several days. The sap crystallizes and forms long clumps similar to stalactites. The juice is violet and very bitter when it drips, but on contact with the air and the strong Sicilian sun it dries and sweetens. The pieces that form on the lowest incisions, or the pieces that are collected on tiles placed under the tree, are less crystalline, more glutinous, and form moist adhesive masses of a dark brown colour. These are less valued.

One of the most problematic issues in the distribution and use of manna on an industrial scale is its poor hygienic condition. The solution to this problem was found with the "invention" of "liquid manna", which permits a more hygienic and convenient use while maintaining manna's beneficial properties. Manna is bought from local forest harvesters, diluted in water, purified, filtered and packaged in bottles. This manna solution can be used in a variety of ways: as a sweetener, digestive, emollient, intestinal regulator, diuretic or laxative; and for detoxifying, refreshing and internal healing. The product has been patented.

Beers get forest "aromas"

In the Alpine area of the Dolomiti Friulane Natural Park, in the Friuli Venezia Giulia region of northeastern Italy, a small brewery was striving to find its position in the local market and trying to connect its products to the local territory, rich in Alpine forests and awesome mountains. However, it was only when the brewer found the right mixture of yeast, pure spring water, pale and aromatic barley malts and wheat, noble European and American hops, fairtrade spices, and *Picea abies* bark, *Pinus sylvestris* twigs and *P. mugo* buds that he found the key to success. Indeed, the fact that the needles and spruce bark or pine buds were coming from a PEFC-certified forest provided him with a marketing opportunity to sell his products.

These beers are brewed as other beers but have an additional marketing tool (the PEFC label) and an increased visibility because of the particular forest-derived aroma. Some forest owners developed other "forest beers" with local breweries, using chestnut as the fermentation agent, or truffles to provide a different aroma. These are yet more examples of imagination and entrepreneurial spirit resulting in the creation of really innovative NWFP activities.

Essential oils from sustainably managed forests

In the South Tyrol-Alto Adige region of northeastern Italy, a new approach to the sustainable management of *Pinus mugo* ecosystems, with the adoption of "mosaic cutting", has over time permitted the conservation of these important ecosystems, the wise recovery of important pasture areas, the increase of biodiversity and the revitalization of traditional production activities of *mugolio*.

Mugolio has been produced for centuries at a local level for phytothermal baths (*bagni di fieno*) and for medicinal purposes (to heal lung illness). It is an essential oil derived from mountain pine (*P. mugo*) twigs, wood and needles. It is extracted using a very easy mechanical system and can be considered a good example of integrated development at the territorial level.

The local action group (financed by European Union [EU] "Leader +" project funds) for the development of the Sarentino valley in the Alto Adige region, has been promoting *mugolio*, which has resulted in the project's economic advantage in the cosmetic and tourist sectors. The product is also PEFC-certified because the oil is extracted from certified *mugo* pine forests, which is a guarantee of the sustainability and traceability of the source.

The EU financial contribution and the PEFC label gives *mugolio* international visibility, as well as providing local forest owners and farmers with a tool to market the products while maintaining traditional extraction techniques.

Tourism tied to mushroom picking

The last example is a tourist enterprise tied to mushrooms, namely the agritourist hotel "Funghi e Fate" on the central Appennine hills, based in Albareto (Emilia Romagna region), in the PGI (indicazione geografica protetta/protected geographic indication) certification zone called "Fungo di Borgotaro". The activities of this agritourist country house rotate around the finding, picking, cooking and conservation of the *Boletus edulis* porcini mushroom. The owner has also created a "mushroom reserve" so that guests can get to know these products from forest to the kitchen.

Final remarks

There are many other success stories of using NWFPs in an innovative and imaginative way. There are also hundreds of cases – in both Italy and other countries – of NWFP-connected activities that, for a variety of reasons, lack the "last step" to make them successful, such as very small enterprises; higher harvesting costs for wild NWFPs versus cultivated ones; a low or basic knowledge of marketing tools; initial promotional costs; a market often driven by intermediaries who are not interested in giving visibility to producers; consumers' lack of knowledge of the wild/natural origin of NWFPs; and a lack of financial incentives among public and private institutions. Forest-related services (tourism, sport and trekking, adventure parks, etc.) also have their importance in many territorial contexts, but generally involve other types of enterprise capability often lacking in forest owners and managers.

More information and examples will be included in the final report of the research chaired by Dr Gian Antonio Battistel, which will be available in 2010.

Based on my recent experience in Italy, I believe that the key to the success of any NWFP initiative lies in the variety of factors linked to NWFP *promotion* and *sale*. I have also seen that a successful forest owner is a person who is able to promote NWFPs as a perfect blending of tradition and innovation.

I hope that this article will stimulate readers to generate more ideas that will benefit and shed light on the hidden potential of our NWFP world – ideas that will surely become easier when sipping a forest herb tea or enjoying a PEFC-certified "spruce" beer!

Dr Antonio Brunori has been Secretary General of PEFC (Programme for the Endorsement of Forest Certification schemes) Italia since 2001 and Editor-in-Chief of the magazine AF – Agronomi e Forestali *(Professional Agronomists and Foresters) for the past nine years. He has also worked as a researcher in Israel and Brazil and as a technical journalist. E-mail: antonio.brunori@comunicambiente.net*

NWFPS AND THEIR ROLE IN FOOD SECURITY AND HEALTH CARE

NWFPs for food and medicine

Foodstuffs. In recent years, NWFPs have attracted considerable global interest because of the increasing recognition that not only can they improve rural livelihoods, household food security and nutrition, but their harvest may be more ecologically benign than that of timber.

Edible NWFPs used as food staples, supplements and additives include bushmeat, honey, edible fruits and nuts, leaves, shoots, tubers, whole plants and fungi. They are important food sources for forest-dependent communities.

GLOBAL DISTRIBUTION OF DIFFERENT SPECIES YIELDING EDIBLE NWFPS

Africa. Desert date (*Balanites aegyptica*), twisted cluster or stink bean (*Parkia speciosa*), Chinese date (*Zizyphus zizyphus*), mango (*Mangifera* spp.) and the neem tree (*Melia azadirachta*).
Asia. Cashew (*Anacardium occidentale*), mangostein (*Garcinia mangostana*), *tengkawang* (*Shorea stenoptera*), milk fruit (*Chrysophyllum* spp.), gooseberry (*Ribes uva-crispa*), sea buckthorn (*Hippophae* spp.) and cardamom (*Elettaria* and *Amomum* spp.).
Latin America. Brazil nut (*Bertholletia excelsa*), *bacuri* (*Platonia insignis*), *camu-camu* (*Myrciaria dubia*), *cupuassu* (*Theobroma grandiflorum*) and *jatoba* (*Hymenaea courbaril*).

In several African countries, wild fruits play an important role in people's diets and contribute to the economy of the rural community. A study of indigenous edible fruits carried out by the University of Malawi found the following.

- Fruits of the monkey bread tree (*Adansonia digitata*), kharub (*Bauhinia thonningii*) and chocolate berry (*Vitex* sp.) are excellent sources of vitamin C.
- Wild custard apple (*Anona senegalensis*) and Natal mahogany (*Trichilia emetica*) are rich in protein.
- Governor's plum (*Flacourtia indica*) and the snake bean tree (*Syzygium guineense*) are rich sources of iron.
- Baobab (*Adansonia digitata*), camel-foot (*Bauhinia thonningii*) and black plum (*Vitex doniana*) are excellent sources of calcium. The baobab seed kernel is also rich in protein (28.7 percent dry weight) and fat (29.5 percent). As such, it is an important source of vegetable oil for household cooking.

Medicine. Some 35 000 plant species have been used for medicinal purposes. An estimated 80 percent of the world's population depends largely on traditional natural medicines – mostly derived from plants. Over 25 percent of the drugs in modern pharmacopoeias are originally plant derived, either as pure phytopharmaceuticals extracted from plants, or as synthetic derivatives. Forest flora and fauna are a hidden chest of organic chemicals, including phytochemicals, aroma chemicals and agrochemicals. The anticancer compound taxol is extracted from the Pacific yew (*Taxus brevifolia*), and phytochemicals from *Pterocarpus osum* are used in treating sickle-cell disease. The origins of traditional herbal medicine predate all existing records, and the knowledge accumulated over thousands of years in different parts of the world is vast.

All the agro-ecological regions and subregions have a large number of medicinal plants that are used locally, for example: *Alstonia scholaris, Aconitum heterophyllum, Aegle marmelos, Cinnamomum camphora, Aquilaria* sp., *Emblica officinalis, Panax* sp. and *Tinospora crispa* in parts of Asia; *Tagetes glandulifera, Mauritia flexuosa, Pithecellobium avaremotemo, Chinchona* sp. and *Hyptis pectinata* in parts of Central and South America; and *Prunus africana, Curtisia pentata, Cryptocarya myrtifolia, Gnetum africanum* and *Catharanthus roseus* in parts of Africa.

Traditional medicines for local use involve simple preparation methods such as hot and cold water extraction, expression of juice after crushing, powdering of dried material, formulation of powder into pastes via such vehicles as water, oil or honey and even fermentation after adding a sugar source. Preparation of standard extracts and their conversion into dosage forms are activities that can be undertaken as a rural-based small industry to meet the demands of local populations. This is essential in areas where traditional medicines are the main form of treatment for illness. Additional processing with sophisticated machinery, and also with health and safety considerations, is required to produce pure phytopharmaceuticals used in modern medicine. Moreover, as these compounds naturally occur in small quantities in a plant, large volumes of raw material have to be processed to enable economies of scale. (*Source:* Elaine Marshall and Cherukat Chandrasekharan. 2009. *Non-farm income from non-wood forest products.* FAO Diversification Booklet 12. Rome, FAO, Rural Infrastructure and Agro-Industries Division.)

Honey is both a superfood and medicine

Honey is the partially digested flower nectar regurgitated from a bee's stomach. It is also one of the most diverse and delicious foods on Earth.

Honey has been used as food and medicine for perhaps 10 000 years and has been cultivated by humans for at least 3 000 years. We know it today as a substitute for white granulated sugar but, for most of history, honey was the basic source of food sweetening, and sugar only recently became more popular as a low-cost alternative. However, when the benefits of honey are considered, the cost should be irrelevant.

In addition to its many culinary uses, honey has a long and impressive résumé as a medicinal healer. In traditional medicine it has been used for treating gastric ulcers, burns, high blood pressure, sore throats and dry coughs.

Modern medicine is also now recognizing the medicinal benefits of honey. In 2007, research at Penn State College of Medicine (United States of America) concluded that a small amount of buckwheat honey before bed was more effective than over-the-counter cough suppressants for children over two years of age. Also in 2007, the FDA (United States Food and Drug Administration) approved a line of wound care dressings lined in honey. Because honey is high in sugar and low in moisture it has been traditionally used to fight bacterial growth, producing hydrogen peroxide as it draws moisture from wounds. It also contributes to reduced swelling and inflammation.

In addition, honey has been shown to aid digestion, and an Oklahoma allergist even claims that one teaspoon of raw honey every day is effective to treat 90 percent of allergies.

The best honey to buy is raw organic straight from the hive. Most honey is pasteurized and the heating process destroys some of the beneficial properties of the

honey, including some of the phytonutrients. Raw honey is a creamy solid, not liquid, and contains propolis, sometimes called "bee glue", that honeybees use to seal the hive and make it safe from bacteria. Propolis has antibacterial, antiviral and antifungal properties. Raw honey also contains other phytonutrients that have cancer-preventing and anti-tumour properties and may help prevent colon cancer.

Children under the age of 12 months should not be given honey since their immature digestive systems cannot process botulism spores that can be present in honey, maple syrup and corn syrup, but which older systems can handle.

Honeybees are in danger of disappearing from the United States of America because of colony collapse disorder and this, combined with other factors, will continue to raise the price of honey. But pay up. This is pure gold. (*Source*: examiner.com [United States of America], 2 September 2009.)

Medicinal and aromatic plants and their role in attaining food security in the high hills of Nepal

Medicinal and aromatic plants (MAPs) are an integral component of the rich biodiversity of every society. They are also attracting increasing attention from both development planners and environmentalists because of their multiple functions and potential contribution to improving the livelihoods of rural and marginalized communities. MAPs are an important source of income, medicine, dyes, nutraceuticals, food products and cosmeceuticals, benefiting the poor and landless in mountain and highland regions. Earnings from MAPs have predominantly been used to bring about food security by most of the people living in the high mountain areas of Nepal.

Our research focused on Baitadi and Darchula, which are located in the far western part of Nepal and, according to national indicators, the least developed districts of the country. Geographic complexity and remoteness, poverty, food scarcity, illiteracy, few economic opportunities and the absence of land transportation and communication facilities are the major challenges for development in the districts.

The study was carried out in a participatory, consultative and multiperspective (polyvocal) way, combining both qualitative and quantitative data collection methods and utilizing a disclosure and verification approach. The primary data were collected through 16 key informant interviews, three focus group discussions, 52 household level questionnaire surveys (21 female and 31 male respondents) and direct observation.

The study found that the main sources of household production are agriculture and livestock, with MAPs contributing around 12 percent of total household production (5 percent in Baitadi and 18 percent in Darchula).

Most of the households agreed that the contribution of MAPs in household production is high; 39 percent of respondents agreed that it made a moderate change in their food security, followed by significant change (25 percent), no change (24 percent), minimum change (12 percent) and no responses for highly significant. The collection of MAPs has a significant impact on food security for poor and MAPs-dependent people. Similarly, of the ten options that MAPs provide (improved livelihood, diversified livelihood, increase in marketing access, increase in income, increase in knowledge, food security, increase in bargaining power, improved health condition, improved well-being and women's status), respondents mostly ranked food security in the first four. Overall, food security and increased incomes were ranked first.

It is obvious that the collection and sale of MAPs have a positive impact on food security for the local people dwelling in the high mountain areas of Nepal. MAPs are most important for the poor and those holding less land who, in one way or another, are dependent on MAPs for their livelihoods. Some of the major problems faced by MAPs collectors were improper prices for their collected goods, lack of proper market information, inadequate value-addition technology and inadequate physical infrastructures such as roads and warehouses. With better management of MAPs, there would be more possibilities for marginalized and poor households to improve and increase their opportunities to attain food security. (*Contributed by*: Ram P. Acharya, Managing Director, and Rijan Tamrakar, Programme Officer, PSPL, Nepal.)

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***Ramón* nut: a little nut with big possibilities**

Planted by the ancient Maya in their forest gardens and once found throughout Central America, the *ramón* tree (*Brosimum alicastrum*) towers above its neighbouring trees in Guatemala's Maya Biosphere Reserve, providing a habitat for spider and howler monkeys, retaining soils and water and helping to regulate the climate. But it is the fruit of the *ramón* that holds the greatest potential for communities within the reserve and could provide them with a key to alleviating poverty, conserving forests, improving health and nourishing their children.

Locals have long collected the chocolate-flavoured *ramón* or Maya nut, roasting it over an open flame (or drying it with heaters) before grinding it into flour that acts as the basis for an assortment of popular foods. While its nutritious properties are widely known throughout the region, until recently no clearly defined strategy existed for incorporating the nuts into the diets of Guatemala's rural and indigenous children, 49 percent of whom suffer from chronic malnutrition.

Thanks to "Healthy Kids, Healthy Forests" – a programme launched by the Rainforest Alliance, the Equilibrium Fund, the Guatemalan Ministry of Education, the Banco de Desarrollo Rural S.A., the National Forest Service of Guatemala, Alimentos Nutri-Naturales and the Association of Community Forestry Concessionaires of Petén – communities throughout the reserve will now be able to capitalize on the nut's many benefits. The world's first *ramón* nut-based school lunch programme is helping to feed more than 8 000 children from 46 rural communities, while providing jobs for women and offering a real incentive for forest conservation.

The enterprising children – and the adults who accompany them into the forest – deliver their hauls to the local bakery, where they receive one quetzal (about 12 cents) for every pound (0.45 kg) of *ramón* gathered. An all-female staff removes the skins from the nuts before roasting them. "Before, I had no job," says Lubia Flores Rodriguez, who works in the Ixlú bakery removing the nut's tender skins. "Now I come to work and I am able to make a living," she says.

Once they have been roasted, the nuts are ground into flour and distributed to teachers and school boards in nearly 50 communities throughout Petén. The flour is used to make

Brosimum alicastrum

wholesome food (*ramón* is a naturally complete protein, high in calcium, fibre and potassium) for school lunches.

"Worried about poverty and the struggle to feed our children adequately, we found in the *ramón* nut a nutritious food and a source of work for rural women," said Gladis Rodriguez, President of the Association for the Development of Women of Ixlú. "Thanks to the support of the Rainforest Alliance (and other organizations) that helped us start this project, we look forward to a better future for all our families." (*Source*: Rainforest Alliance, 28 August 2009.)

Mushrooms for food and medicine

Mushroom cultivation is a source of economic, nutritional and medicinal value, providing direct benefits to livelihoods. While extra caution is necessary in distinguishing between species that can be consumed as food and those that are lethal, their benefits cannot be overestimated. Trade in cultivated mushrooms can provide a readily available and important source of cash income for men and women as well as act as a valuable safety net during times of stress. For millennia, mushrooms have also been cultivated for their medicinal properties. Above all, mushrooms can make an important contribution to the diets of people in developing countries, which are often lacking in nutrients.

Today, mushrooms are increasingly considered as fair substitutes for meat, with a protein content ranging between 19 and 35 percent. Additionally, their nutritional value is comparable with many vegetables: they are a good source of vitamins B, C and D – including niacin, riboflavin, thiamine and folate – and contain various minerals such as potassium, phosphorus, calcium, magnesium, iron and copper. Mushrooms also provide energy, yet are low in fat and fibre. Moreover, the high water content of fresh mushrooms (about 90 percent) makes prolonging their shelf-life and preserving their flavour and nutrients simple (through drying).

While medicinal fungi have routinely been used in traditional Chinese medicine, only recently has commercial activity related to the medicinal properties of mushrooms increased. In fact, in addition to all essential amino acids, some mushrooms have the medicinal benefits of certain polysaccharides, believed to boost the immune system.

Today, an estimated 6 percent of edible mushrooms are known to have medicinal properties and can be found in health tonics, tinctures, teas, soups and herbal formulas. *Lentinula edodes* (*shiitake*) and *Volvariella volvacea* (Chinese or straw mushroom), both edible fungi with medicinal virtues, are widely diffused and cultivated. *Shiitake* mushrooms are said to combat tumours and possess antiviral properties; they also remove cholesterol from the bloodstream. Other species, such as *Pleurotus* (oyster), *Auricularia* (*mu-er*), *Flammulina* (*enokitake*), *Termella* (*yin-er*) and *Grifola* (*maitake*) are known, to varying degrees, for boosting the immune system, lowering lipids, combating tumours and regulating blood pressure as well as possessing microbial and viral properties, among other therapeutic effects. (*Source*: Elaine Marshall and N.G. (Tan) Nair. 2009. *Make money by growing mushrooms*. FAO Diversification Booklet 7. Rome, FAO, Rural Infrastructure and Agro-Industries Division.) (*Please see pages 34–35 for more information.*)

NWFPs and food security

NWFPs can provide important community needs to improve rural livelihoods, contribute to household food security and nutrition, help to generate additional employment and income, offer opportunities for processing enterprises, contribute to foreign exchange earnings and support biodiversity conservation and other environmental objectives.

NWFPs contribute in many ways to combating malnutrition and improving diets in local communities and rural households. Not only do they directly provide food and medicines, but they also indirectly increase income and improve agricultural production, thereby improving access to food. Hunger and malnutrition would be significantly worse if it were not for the contribution of trees and forests to household food security.

Many rural households in developing countries, and a proportion of urban households, depend on plant and animal products from forests to meet some part of their nutritional, cooking and/or health needs. Trees and forests contribute to improving the well-being of local populations by providing the right variety of food, flavourings, medicines and beverages.

Furthermore, NWFPs can offer vital insurance against malnutrition or famine during times of seasonal food shortage or emergencies such as droughts, floods or wars. It is common for rural households to depend on forest foods between harvests, when harvested stocks have been consumed but before new crops are mature. Women, in particular, count on these resources for supplementary

ONE-SIXTH OF HUMANITY IS HUNGRY

- **How many?** FAO estimates that 1.02 billion people are undernourished worldwide. This is the highest number since 1970.
- **Where do the hungry live?** Sub-Saharan Africa: 265 million; Asia and the Pacific: 642 million; Latin America and the Caribbean: 53 million; Near East and North Africa: 42 million; developed countries: 15 million. Asia and the Pacific, the world's most populous region, is home to the largest number of hungry people. Yet sub-Saharan Africa has the largest prevalence of undernourishment relative to its population size (32 percent).
- **Why?** The current global economic slowdown – following soaring food prices in 2006–2008 – lies behind the sharp increase in world hunger. It has reduced incomes and employment opportunities of the poor and significantly lowered their access to food. Yet longer-term chronic hunger symptomatic of poverty is at the core of the problem.
- **What are the options?** The number of hungry people has remained above 800 million for the past 40 years. This reveals the fragility of the present food system. In order to fight hunger, a twin-track approach remains key, involving both measures for immediate relief and more fundamental structural changes.

(*Source*: www.fao.org/hunger/en/)

nutrition, emergency food, and many other important products they need to ensure the nutritional well-being of their families.

NWFPs also contribute indirectly to household food security through the generation of income and employment from their sale and exchange. Marketable forest products provide the opportunity to supplement household income, as well as constituting a relief source in times of shortages.

NWFP-earned income is used to purchase foods; in other cases it may be invested in agricultural land or agricultural inputs, such as seeds or livestock. Thus the link between generated income and food security must be assumed, while keeping in mind that income also contributes to other "securities", such as housing, education or clothing.

The contribution of NWFPs to food security in developing countries, therefore, is significant, diversified and valuable; it ranges from direct production of food to provision of jobs and income, with wild food plants complementing food intake and being consumed throughout the year.

(*Contributed by*: Ms Agnese Bazzucchi, Volunteer, NWFP Programme, Forest Economics, Policy and Products Division, Forestry Department, FAO. E-mail: non-wood-news@fao.org)
Agnese Bazzucchi is working as a volunteer with the NWFP Programme and using this experience as part of her Master's degree in food security.

Major wild edible plants in India

The Nilgiri Biosphere Reserve (NBR) in the southern Western Ghats, India, hosts a wide variety of wild edible plants. Local tribes have a wealth of knowledge about these forest resources, consuming flowers, roots, fibres, tubers, leaves and so on for food. Women and children in particular have long collected wild foods, although today the practice is declining. The loss of interest on the part of younger generations – who prefer foods from local markets – is a major threat to the local knowledge base.

Among the foods collected are the following.

***Dioscorea tomentosa* L.** (Dioscoreaceae): Nooral Kangu, Irula. A sparsely prickly, tuberous climber common on forest slopes and borders of many districts. These tubers are harvested during the summer season and eaten boiled (with salt) or deep-fried.

***Cycas circinalis* L.** (Cycadaceae): Irula, Kurumba. A short palm-like tree found in some isolated pockets of the NBR. Its

Cycas circinalis

seeds are filtered and the kernels ground into a paste (often with salt and chilli).

***Acacia pennata* (L.)** Willd. (Mimosaceae): Seengai dagu, Irula, Kurumba. An extensive armed straggler found along forest borders and scrub jungles. Its young leaves are harvested during pre-monsoon periods, cooked with lentils, and eaten with millet.

Scutia myrtina (Burm.f.) Kurz (Rhamnaceae): Kokkimullu, Sodali, Irula, Kurumba. A straggling thorny shrub found commonly in forest borders and scrub jungles from plains to 1 200 m. Its ripened fruits are edible.

***Dioscorea oppositfolia* L.** (Dioscoreaceae): Rhea Kangu, Irula. An extensive climber found on thickets and in secondary forest patches above 750 m. The plant's tuber is the main food source for the Kurumba community. The tubers are harvested from January to April and eaten boiled (with salt) or deep-fried.

Bambusa arundinacea (Retz.) Roxb. (Poaceae): Dodda biddur, Kurumba, Billia moonga, Irula. A tall, erect green bamboo with spines found in moist deciduous to semi-evergreen forests. The young shoots are harvested and cooked with tamarind and other ingredients; they are often eaten with millet.

***Solanum nigrum* L.** (Solanaceae): Kakkae dagu, Irula. A small shrub found along riverbanks, in agricultural fields and wastelands from plains to 1 500 m. The leaves are cooked with lentils and often eaten with rice or millet. The shrub also boasts medicinal properties and is used by locals to treat stomach aches, chest pains and mouth ulcers.

***Cissus quadrangularis* L.** (Vitaceae): Naralaikkodi, Irula, Kurumba. A rambling shrub with a quadrangular stem found along forest paths and scrub jungles of deciduous forests. The young stem and leaves are combined with tamarind to make chutney.

Cereus pterogonus Lemaire (Cactaceae): Bella Kalli, Irula. A profusely branched columnar shrub found alongside roads and fences. The flowers are harvested from March to June and cooked with salt; they are commonly eaten with rice.

***Syzygium cuminii* (L.)** Skeels (Myrtaceae): Naaval, Irula, Kurumba. This evergreen tree is found in a variety of habitats – from plains to 1 400 m. Its ripened fruits are dark blue and eaten raw. Large quantities of these fruits are collected between June and July and sold locally in markets.

(*Source*: extracted from: "Major wild edible plants of the Nilgiri Biosphere Reserve in India" in *Voices from the Forest*, Edition No.17, September 2009.)

Edible insects "rediscovered" in Central Africa

Many edible insects, such as caterpillars and grubs, are important sources of protein and should be considered an alternative in efforts to increase food security in Central African countries, nutritionists said today. While this is common knowledge to many of the peoples of the Central African region, the importance of edible insects has only now been rediscovered by nutritionists.

According to a study published by FAO, edible insects must be reconsidered as an important source of protein in Central Africa. These widely eaten insects are not only nutritious, but also potentially income generating and a manner of biological pest control.

Caterpillars are already an important food intake for many in Central Africa, according to the FAO study. About 85 percent of participants in a survey in the Central African Republic consume caterpillars; 70 percent in Congo Kinshasa (the Democratic Republic of the Congo) and 91 percent in Botswana. "Edible insects from forests are an important source of protein and, unlike those from agricultural land, they are free of pesticides," said Paul Vantomme, an FAO forestry expert.

For every 100 g of dried caterpillars, there are about 53 g of protein, about 15 percent of fat and about 17 percent of carbohydrates. Their energy value amounts to around 430 kilocalories per 100 g. The insects are also believed to have a higher proportion of protein and fat than beef and fish with a high energy value.

Depending on the species, caterpillars are rich in important minerals such as

potassium, calcium, magnesium, zinc, phosphorus and iron, as well as various vitamins, the FAO study revealed. Research shows that 100 g of insects provide more than 100 percent of the daily requirements of the respective minerals and vitamins.

Because of caterpillars' high nutritional value, in some regions flour made from caterpillars is mixed to prepare pulp given to children to counter malnutrition, said Mr Vantomme. "Contrary to what many may think, caterpillars are not considered an emergency food, but are an integral part of the diet in many regions, according to seasonal availability. They are consumed as a delicacy," he added.

The collection of edible insects is also a good source of income, especially for women, as they require little capital input if gathered by hand. Insects are widely offered in local village markets, while some of the preferred species, such as Sapelli caterpillars, reach urban markets and restaurants.

Transborder trade in edible insects is significant not only within Central African countries, but also with the Sudan and Nigeria. On a smaller scale, they are even exported to France and Belgium, two countries that according to the study import about 5 tonnes and 3 tonnes respectively of a dried caterpillar species annually from Congo Kinshasa. The annual export to Belgium is valued at US$41 500.

Many caterpillar species nourish on fresh leaves. Although trees usually respond by producing a second growth of leaves, after several attacks trees may lose vitality, according to FAO. "Harvesting caterpillars thus contributes to maintaining the natural reproduction of trees and serves as a biological pest control," the United Nations agency said.

According to Mr Vantomme, Central Africa's edible insects need to be rediscovered by Western scientists and food security researchers. "The nutritional and economic value of edible insects is often neglected and we should further encourage their collection and commercialization, given the benefits to the environment and human health," Mr Vantomme said. (*Source*: afrol News, 8 November 2009.)

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SNAILS PROVIDE A TASTY SOURCE OF IRON, STUDY FINDS

Snail meat could be a cheap, tasty and nutritious food, and help reduce anaemia caused by a lack of iron in the diet, according to a Nigerian researcher. Ukpong Udofia, a nutritionist at the University of Uyo, analysed the nutritional value of the meat of the giant West African land snail (*Archachatina marginata*). She found it to have a higher protein and iron content, and lower fat content, than beef, as well as containing many essential nutrients such as calcium, magnesium and vitamin A.

The snail is native to forests and areas of moist vegetation in West African countries such as Cameroon, Côte d'Ivoire, Ghana and Nigeria.

Udofia tested the tastiness and acceptability of the meat by asking a group of mothers and their school-age children whether they preferred a pie made from snail or beef. Most preferred the appearance, texture and flavour of the snail pie.

Iron-deficiency anaemia is common in children and women across Africa and the developing world. Caused by a lack of iron, it is exacerbated by diseases such as malaria and contributes to a fifth of maternal deaths, according to the World Health Organization (WHO).

Snail meat has figured in the diet of Asian countries, and of African people living in forested areas, for thousands of years. Pa Tamba Ngom, a researcher in the nutrition programme at the Gambia's Medical Research Council, added: "Here in the West African subregion, especially Senegal and the Gambia, it is very famous and included in one of our main rice dishes, known as *benachin*". Ngom said that small-scale snail farming systems should be expanded to protect wild snail stocks from becoming further endangered by overgathering.

Sonya Begg, an Australian snail farming expert, said the snail could pose a public health threat if eaten raw and infected with the rat lungworm parasite (*Angiostrongylus cantonensis*), which can cause a rare form of meningitis in humans. She added that people should eat only farmed snails to ensure the snails had eaten only non-poisonous foods.

Udofia's study has been published in the *International Journal of Food Safety, Nutrition and Public Health*. (*Source*: ScienceDaily, 2 December 2009.)

Food from the forests of tropical Asia

The importance of forest foods in providing food security is often underestimated. For many indigenous communities especially, foods gathered from forests are vital, particularly during times of famine or seasonal scarcity. Their nutritional value – in terms of proteins and micronutrients – cannot be overestimated. Leafy vegetables, mushrooms, herbs, fruits, nuts, tubers, honey and insects are only some of the foods that forests produce.

The destruction of forest habitats, however, has severely threatened this vital food base. Together with the introduction of "modern", processed and comparatively nutrient-poor food items into the diets of indigenous communities and cultural erosion, local knowledge of these valuable foods is dissipating.

Below is a taste of some forest foods – whose nutritional value often goes unrecognized – found in wide use in tropical Asia.

***Beska-kenil* chutney**

Kenil, a species of red ants of the genus *Crematogaster*, are found in many parts of tropical Asia, including the Durwa and Koitoor tracts of Bastar and Malkangiri districts in eastern and central India, where they are widely used in local diets. These ants make small nests in the leaves of trees, especially sal (*Shorea robusta*) trees; they have eggs and larvae that are available all year. Being rich in ascorbic acid, the ants are useful in treating common colds.

Beska refers to the plant as well as the root of *Costus speciosus*, a herb of the ginger family that sprouts after the first showers of the monsoon in many parts of

tropical Asia. Its leaves are spirally arranged on the stem, with white flowers and a bright red calyx. Its ginger-like rhizomes are slightly stringy and not so strong as ginger. For this reason, it can be eaten raw in large quantities. It is also a popular ingredient in many types of chutney. Combined, *beska-kenil* makes chutney, often used in tropical Asian diets.

Sago worm

The larvae of the sago weevil (*Rhynochophorus bilineatus*) are extremely efficient transformers of *Eugeissona utilis* sago starch into more nourishing fat and protein. Locally, they are known as "baby fat" and are viewed as important for the growth of young children. (*Source*: Jenne de Beer. Extracted from: "Food from the forest" in *Voices from the Forest*, Edition No.17, September 2009.)

Evaluating underexploited indigenous fruits to improve food security

The African continent is home to some 3 000 species of wild fruit trees. In Cameroon alone, fruits and seeds from over 300 indigenous trees are eaten, according to a study carried out by Cameroon's University of Dschang. A similar study conducted by FAO in rural Ethiopia found that wild foods, also known as "famine foods", can cover an estimated 80 percent of the food needs for some families, particularly in times of stress. Chocolate berries, star apples, gingerbread plums, monkey oranges, tree grapes and a host of other unexploited African plant resources might soon help broaden and secure the continent's food supply, says a study published by the United States National Research Council.

According to the study, a vast array of African wild fruits is ripe for domestication. Tree domestication is not new to the continent. During the mid-1990s, researchers from the World Agroforestry Centre surveyed local people across West Africa, southern Africa and the Sahel to understand which indigenous trees they valued most. "We were expecting people to point to commercially important timber species, but what they valued most were indigenous fruit trees," says Zachary Tchoundjeu, a botanist at the World Agroforestry Centre's regional office in the Cameroonian capital, Yaoundé. Except for their biological names, many specialists at the Centre knew next to nothing about these fruits; in contrast, locals had long been utilizing them in their diets.

In response, the World Agroforestry Centre launched a tree domestication programme in 1998. Unlike traditional programmes that involve the development of new varieties by agribusiness companies, which are then grown in monoculture plantations, local farmers play a central role in developing, testing and selecting new varieties. Additionally, farmers receive training in horticulture techniques. At the time there were just two farmer-run nurseries in Cameroon; today there are several hundred. Many farmers have seen their incomes increase threefold.

"The last great round of crop domestication took place during the green revolution [in the mid-twentieth century], which developed high-yielding varieties of starchy staples such as rice, maize and wheat," says Roger Leaky, a former director of research at the World Agroforestry Centre. "This new round could scarcely be more different." Leaky calls these fruits of the forest "Cinderella species," because they have long gone unexploited. It is time, he says, that these indigenous fruits step into the limelight. (*Source*: extracted from: "Cinderella fruit: wild delicacies become cash crops" by Charlie Pye-Smith in *New Scientist*, issue 2733, 10 November 2009.)

A vegetable fern, *Diplazium esculentum* – potential for food security and socio-economic development in the Himalayas

Belonging to the tropical eastern hemisphere and distributed in Southeast Asia, China and Japan, *Diplazium esculentum* Retz. Swartz (Athyriaceae) is one of the top preferred edible ferns in the Himalayas. In many parts of eastern Southeast Asia, people use this mineral- and energy-rich edible species by cooking the upper shoots/fronds as vegetables.

In the Indian Himalayas, the species is known by different names – *ningru* in Sikkim, *lingri* in Himachal Pradesh (HP), *lingra* in Uttarakhand and *dhekia* in other northeastern states. In Bangladesh, the plant is commonly called *dheki shak*, *paloi shak* and, in tribal areas, *teria shak*. Distributed worldwide, the genus *Diplazium* represents 474 species and eight hybrids. Tropical America alone is known to have 100 species.

The stout caudex in *D. esculentum* may reach 1.5 m in height; fronds are bipinnate or tripinnate with sori on both leaf surfaces along the veins. Available literature indicates that the edible fronds are rich in iron, phosphorus, potassium and protein, richer

SUPERFRUIT GOJI BERRY (*LYCIUM BARBARUM*)

Superfruits are a relatively new addition to contemporary diets. They are, for the most part, small fruits with some amazing claims as to their health benefits and nutritional content. Since they are relatively new, there have been few clinical trials on which to base these claims.

The bright orange to red goji berry is grown mainly in Tibet (Autonomous Region). There is some debate linking the goji berry to the wolfberry which, although the same species, may come from two different places. China and Mongolia are thought to be home to the wolfberry, while goji has been specifically linked to the berry in Tibet. The Tibetan goji alone is thought to have over 40 species. The inside of this colourful berry is laden with seeds. Berries are not picked but shaken from the trees on to mats where they are left to dry before packaging. Touching the berries before packaging and/or drying is said to cause oxidation, turning the goji black.

According to goji legend, use of the berry stretches back over 3 000 years. It is said that Tibetan monks who drank from a well surrounding goji berry vines found longevity by drinking the water into which goji berries fell at random. The monks then spread the word through travellers, creating a conspicuous amount of interest about the new anti-ageing miracle.

Goji berries seem to explode with nutritional value. They have at least 18 amino acids, 21 trace minerals, protein, and are a truly rich source of carotenoids. Of the 21 trace minerals one, germanium, is of particular interest for fighting cancer. It contains vitamins B, C and E, and essential fatty acids.

Aside from their anti-ageing uses, goji berries are used to protect the liver and kidneys, help eyesight, improve circulation, bolster immunity, soothe skin problems and help with anxiety and sleeplessness. Although not all of these uses have been proven via clinical studies, there are some studies that seem to have a positive bearing on the use of goji berries overall. (*Source*: examiner.com, 10 August 2009.)

than that of many conventional vegetables and many wild edibles. The mineral content has also been reported to be several times greater than that present in many commercial fruits.

The most common recipe using *D. esculentum* involves cooking the dried fronds in oil or butter; using them in a vegetable curry is less preferred. In the northeast, especially in Sikkim, and in the central and northwestern Himalayan states (HP and Uttarakhand), the local folk relish both vegetables and pickles from *D. esculentum*. Natives consider these recipes effective both to counteract constipation and as an appetizer, especially as a pickle.

In literature, the plant is used ethnomedicinally to cure skin ailments. A peoples' perception study by the author covering a dozen villages in the Parvati valley (HP) revealed that, of 50 consumed wild edibles, *D. esculentum* is used as a vegetable/pickle by an average of 66 percent of the respondents. In many Himalayan areas, including the study area, the dried leaves are used as cattle bedding.

Besides its edible use, in Bali *D. esculentum* (locally called *pakis*) is used in traditional ceremonies. The young shoots are used as a vegetable (*paku* shoot) and eaten as *ulam* (green leaves) in Malaysia. Studies have found total antioxidant activity in the fresh plant part over boiled *D. esculentum*.

D. esculentum is marketed in major parts of the Indian Himalayas, neighbouring Nepal and many other countries. A bunch of stout shoots with fronds is sold locally at 8–12 rupees in Sikkim and HP. The pickle eaten with meals or at breakfast is very popular among the native people throughout the Himalayan states where the plant is available, with local market rates of *lingri/ningru* pickle, in both Kullu district (HP) as well as Sikkim, ranging from 60 to 100 rupees, depending upon location and bargaining power. The market season is limited from March/April to July in HP, but this season is extended in the rainy state of Sikkim, where plants are available throughout the year, with a reduced supply during the winter months. In Sikkim, of over 40 wild edible plants being marketed, *D. esculentum* is one of the top species sold in terms of both quantity and number of retailers, together with *Spondias axillaris, Urtica dioica*, bamboos, *Baccaurea sapida*, etc. Highlighting the species as very rare, marketing bids are found on Web sites and advertisements are appearing for the purchase of spores, leading to pressure on the species in the wild.

Very little interest has been shown in assessing the cultivation potential of *D. esculentum*. The author had tried planting rhizomatous parts along garden ponds and shady well-nourished soil beds, but discovered that the best growth is in wild habitats; perhaps the species has special microhabitat requirements that are not easy to obtain in *ex situ* conditions.

At present, the sustainable harvesting and simultaneous habitat conservation of *D. esculentum* may boost the cash income of marginal people and their food security with this nutritive source, especially in rural areas.

Research on population biology, habitat dynamics and propagation and cultivation prospects of *D. esculentum* is a prerequisite – especially considering the emerging threats from global warming and climate change – as the species prefers wet/shady locations along springs, which are often susceptible to both global warming and environmental degradation. (*Contributed by*: Dr Hemant K Badola, G.B. Pant Institute of Himalayan Environment & Development, Sikkim Unit, PO Box 40, Gangtok (Campus: Pangthang), Sikkim 737 101, India. E-mail: badolahk@yahoo.co.in *or* hkbadola@rediffmail.com)

Biodiversity for human health

"Just as nutrition, access to health care and clean water, biodiversity is a fundamental determinant of health." With these words, Dr Aaron Bernstein, MD, Professor at Harvard Medical School and its Center for Health and the Global Environment, opened the keynote speech at the Southeast Asian Nations Conference on Biodiversity, held from 21 to 23 October 2009 in Singapore. Over 300 delegates from ASEAN (Association of Southeast Asian Nations) countries convened to discuss emerging trends and issues on biodiversity conservation and management. The conference assessed the status of biodiversity, in light of the 2010 Convention on Biological Diversity target to achieve "a significant reduction of the current rate of biodiversity loss at the global, regional and national level as a contribution to poverty alleviation and to the benefit of all life on Earth".

Dr Bernstein discussed the importance of biodiversity in human health, citing the example of bushmeat consumption and the emergence of HIV. The increase in hunting and consumption of bushmeat in western Equatorial Africa, he says, has been implicated with the emergence of HIV/AIDS. According to Bernstein, people began consuming bushmeat because of dwindling fish stocks. Other reasons include expanding populations and new access to parts of forests previously inaccessible.

> At least 40 percent of the world's economy and 80 percent of the needs of the poor are derived from biological resources. *Holger Standertskjöld, Ambassador, Head of the Delegation of the European Commission to Singapore at the conference.*

Preserving these wildlife populations is crucial for studying and understanding human infections. At present, says Bernstein, the current rate of extinction of species was last seen 65 million years ago. Climate change might accelerate this trend, bringing a third of current species to extinction by 2050. Bernstein, who has dedicated a large part of his professional career to examining the health dimensions of a changing environment (e.g. biodiversity loss and climate change), also explained the importance of natural products as sources of medicine.

"We must consider whether or not to deal with what is necessary to prevent the ailments that we can foresee on the horizon. In making this deliberation to act or not, to consider biodiversity loss is more than a matter of ethics, is more than a matter of spirituality, it is more than a matter of how much it is worth. It is perhaps, without fear, a matter of health. Ultimately, we have no choice when it comes to protecting biodiversity. We must protect the natural world if we are to protect ourselves," Bernstein concluded. (*Source: Manila Bulletin*, 26 October 2009.) (*Please see page 69 for more information.*)

BAMBOO: ITS POTENTIAL ROLE IN CLIMATE CHANGE

Bamboo in climate change and poverty alleviation

Bamboos have been overlooked in the current climate change regime. They are missing in the forest definitions of the Marrakech Accords (MA) and the Clean Development Mechanism (CDM). They have been disregarded in Intergovernmental Panel on Climate Change (IPCC) Assessment Reports and in current IPCC guidelines for Greenhouse Gas Emission Inventories. The fact that bamboos are botanically not trees but grasses, and that they have traditionally been considered "the poor man's timber" may help to explain these omissions. Other global forest definitions, such as those of FAO, include bamboos.

A recent study (NWFP Working Document 8) provides arguments for considering bamboos as forests under the CDM, under REDD (reducing emissions from deforestation and forest degradation) and in National Communications. The Executive Board of the CDM has recently concurred to allow bamboo in afforestation/reforestation (A/R) projects, but has left the final decision to individual countries. Up to now, only two Designated National Authorities (DNAs) have accepted bamboos. These decisions apply to the CDM only.

Bamboo distribution overlaps with prominent CDM host countries in Asia and Latin America, which can also build on considerable experience with bamboo. In contrast, most potential host nations in Africa lack practical exposure to the CDM, but many are at least familiar with management of natural and planted bamboo. Here, bamboo A/R projects might eventually spawn a proactive administrative structure and CDM projects in other sectors.

Not considering tree-like bamboo stands as forests in the REDD process neglects significant carbon stores, highly effective carbon sinks and proven pillars of rural livelihoods. It invites destruction of bamboo forests. New bamboo plantations may curb the pressure for deforestation by serving as wood substitutes, as woody components of permanent agroforestry systems, and as a means to curb the spread of slash-and-burn agriculture. Thus, incentives for bamboo plantations could become an important component of a REDD strategy.

The current CDM has essentially bypassed the forest sector which, up to now, harbours only eight CDM projects from over 1 800 worldwide. In spite of its explicit goal, the CDM has largely failed to reduce poverty, improve livelihoods or foster development in rural neighbourhoods. Sequestering carbon in bamboo A/R projects might correct this deficit by circumventing many of the current impediments for forestry projects. Bamboos combine many attributes that predestine them for a sizeable niche in the CDM, particularly in small-scale A/R projects.

Advancing climate change will not spare bamboo. Northerly range shifts have already occurred. Missing are more reliable forecasts of how bamboos will cope with projected extreme temperatures, droughts, floods, late or early frosts, or more intense storms. In any case, short growing cycles and a rich palette of species should allow for hedging and flexibility in adapting stands to climatic changes.

Their characteristics also predispose bamboos for a prime role in adapting human societies to climate change. Reducing poverty and boosting rural livelihoods are prime measures for adaptation. Moreover, bamboos may be integrated rapidly into many agroforestry, shifting cultivation and urban systems. Beneficial environmental effects of bamboo, which range from reclamation of severely degraded sites to providing shelter during floods, tsunamis and earthquakes, may foster project developments. However, not all environmental effects of bamboo are beneficial.

Moreover, bamboo projects in the CDM and REDD face their own, specific hurdles. In particular, sampling designs, carbon assessment methods and default parameters devised for timber trees rarely apply to bamboo. However, the many advantages of bamboos, the current extent of bamboo forests, and a much larger area of potential distribution, would justify amending the IPCC guidelines and/or adding specific methodology tools for bamboo. Regional studies on bamboo carbon assessment, perhaps linked to regional bamboo pilot projects, could reduce these hurdles, support bamboo as the "poor man's timber" and establish a sizeable niche for bamboo. The poor man's timber could become the poor people's carbon sink. (*Source: The poor man's carbon sink: bamboo in climate change and poverty alleviation*. NWFP Working Document 8, FAO.)

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(*Please see page 72 for more information on this publication.*)

Bamboo to help house tsunami-struck Samoans

For years, Mr Durnford Dart has run his bamboo farm at Belli Park, Queensland, Australia. On 13 October he is flying to Samoa to help to emergency-house as many Samoans as he can, after the devastating tsunami which has left thousands homeless. It is not the first time he has been there but this time it is a voluntary mission to "do what I can" to ease the plight of Samoans, with emergency shelter.

Mr Dart first established his commercial bamboo farm, Bamboo Australia, 20 years ago, growing edible shoots as a vegetable crop, which was subsequently followed by an industry for bamboo poles for building structures. "Then 15 years ago I built my first geodesic dome, a type of emergency shelter." Five years ago, Mr Dart began to trade with Samoa, using bamboo as a viable alternative to importing timbers for structures. "It started with nothing, then importing plants to propagate," Mr Dart said. "On my second visit three years ago I erected a dome for the forestry department; they loved it."

That was the introduction, which Mr Dart says has now gone full circle with the tsunami impacting heavily on the island's 160 000 population. "You can put the domes up in two hours, but in the meantime the company making connector plates for them

went out of business," he said. "Fortunately, a technical college based in the Samoan capital, Apia, had the tools to make the plates; it got clearance, and they're coming off the line."

There is one more problem: the bamboo planted three years ago takes four years to mature, despite 4–7 m of rainfall and volcanic soil. It is unknown how many shelters can be built in a short time, but Mr Dart estimates 20 to 50 to start with. (*Source*: Sunshine Coast Daily [Australia], 11 October 2009.)

Engaging rural bamboo growers in northwest Viet Nam with carbon finance: a joint mission to northwest Viet Nam

Viet Nam is one of the top five most affected countries in the world as a result of climate change. In July 2009, FAO and INBAR (the International Network for Bamboo and Rattan), supported by a carbon trade consultant and Prosperity Initiative, a non-profit organization based in Hanoi, carried out a fact-finding mission on carbon finance opportunities in rural activities centred around bamboo forests and value chains in Thanh Hoa province of Viet Nam. Visits were made to rural communities assisted by the LDP (the Luong Bamboo Development project), which operated under the leadership of the CRD (Cooperative for Rural Development) in Quan Hoa district and has hands-on activities in one of the potential target areas. Local bamboo processing plants were also visited to review their potential for carbon emission offsets from waste piles (avoiding methane) and turning processing waste into renewable energy (briquettes).

From poor man's timber to poor man's carbon credits?

Bamboo forests in Viet Nam support mostly meagre rural incomes. Often the poorest households and smallest-scale farmers are most dependent on bamboo. According to Prosperity Initiative operating in Thanh Hoa province, around 52 percent of the individuals with bamboo incomes live below the poverty line, 63 percent of bamboo sector jobs are on-farm family work, and 31 percent are carried out by female workers.

Supply chains of saleable bamboo products are long and the numerous intermediaries leave only a small fraction of the value of bamboo to farmers. Bamboo is often labelled as "poor man's timber" because of its versatile local uses. It grows in forest-like natural formations either in monocultures or mixed stands with trees, and can support agroforestry and mixed cropping systems. Bamboo forest is also included in the relevant United Nations Framework Convention on Climate Change (UNFCCC) definitions, meaning that it can yield "poor man's carbon credits" as well.

Some recent studies suggest that bamboos are more effective plants than trees in increasing carbon stocks through sequestration of CO_2. A wide range of estimates are provided by researchers, putting the CO_2 sequestering potential between 12–40 tonnes/ha/year (above ground). Additionally, the extensive root system of bamboo builds up the carbon sink faster than bamboo culms or trees.

But not all bamboo planting will be eligible for carbon finance, as certain lands may fail to comply with the criteria set forth in the carbon project rulebooks. The CDM (Clean Development Mechanism) requires that land must not have been cleared after 1990, and the Voluntary Carbon Standard (VCS) requires land not to have been cleared in the previous ten years. Project developers should also be aware that the provisions of CDM post-2012 are yet undecided, so a sizeable risk for non-compliance exists.

Preconditions have to be met

A real breakthrough remains to be made in commercializing carbon offset credits from bamboo forests. Making the transformation from poor rural communities using bamboo for subsistence into carbon offset suppliers is a development challenge that requires, for example:

- good grassroots-level organization of communities and their sensitizing to carbon income;
- pooling of bamboo smallholdings into large enough blocks to reach critical scale;
- clear land tenure and benefit-sharing rules;
- firm commitment to the decided planting targets and management plans of bamboo forests;
- knowledge of the past deforestation and land-use changes in the area;
- applicable methodologies on carbon accounting, data collection, monitoring/auditing;
- proving of additionality and registering of the carbon offset project activity; and
- certification against a suitable carbon standard, followed by verification, issuance and putting carbon commodities for sale.

Conclusions

1. Bamboo's ability to sequester carbon during its fast growth, both into above-ground biomass and into its extensive root system, was well demonstrated in the field visit and by the back-of-the envelope calculations made.
2. On newly established bamboo plantations, a minimum scale of 4 000 ha would provide an opportunity to generate carbon revenue on a significant scale from the sales of credits.
3. On this scale, a potential project would repay the investments into carbon development costs within the first four years. Moreover, the activity would generate sizeable net revenues during the later years, which is a precondition for any economically sustainable carbon project development.
4. The replanting of degraded and barren forest lands is a government objective, supported by funding programmes that are often not performing according to their stated goals.
5. If large-scale bamboo planting initiatives are promoted for carbon finance for the Viet Nam Government, carbon finance would need to be integrated from the very beginning in the planning process and significant efforts be made to identify eligible lands, and to set up the required technical and organizational infrastructure.
6. In Viet Nam, any planting activity on the scale of various thousands of hectares will usually be structured as a government programme. In this context it is important to recognize that relabelling existing government programmes for the planting of bamboo (e.g. the Government's 661 Programme) as carbon activities does not qualify for passing the additionality test that is inherent to project-based carbon finance. Only newly designed programmes with distinct funding sources would be approved and become eligible for carbon finance.
7. The contribution of carbon revenues to cover planting costs will always be minor or negligible. This is not only because of the small size of attainable carbon revenues and the typically high planting costs, but also because of the time lag in accrual. It is therefore crucial to be aware that financing for the actual establishment of plantations will always need to draw on other sources, unrelated to carbon.

8. The issuance of carbon offset credits can be requested on an annual basis, with bridge funding for the first two to three years, which makes a Payment for Environmental Services (PES) attractive to smallholders. It means that there is a continuous flow of carbon offsets for sale. This helps farmers understand carbon as a perennial income without lengthy gestation periods.

Way forward

Additional income generation through bamboo carbon offsets is clearly a potential rural development innovation. Carbon financing has a clear upside potential to lift farmers out of poverty, especially in northwest Viet Nam. A PES is perceived as a potential mechanism to construct a system for accruing bamboo-related carbon income and distribute it to alleviate rural poverty.

Any such project will have to accommodate specific financing needs in order to run the PES scheme and meet the payouts that are agreed with farmers. The carbon credits sales strategy will be geared towards replenishing a PES fund. The fund could also function as a mechanism to balance liabilities among farmers.

It will need to be decided how farmers will be rewarded for compliance with the commitments they assume in establishing and tending bamboo plantations. For instance, there could be constant payouts on a per area unit basis or payouts could be tied to actual carbon removals achieved in individual plantations. It will also be necessary to set aside a fraction of income in order to cover non-complying farmers.

FAO can take leadership in alleviating supply-side constraints, developing carbon financing and marketing competencies, and supporting knowledge and technology transfer to work for the rural poor around bamboo forests. FAO's role is critical in creating a carbon trade platform, and leading the deployment of PES.

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Bamboo huts on stilts win climate award

Building flood-resistant, elevated bamboo houses in Ecuador, and exchanging climate information via "interactive" radio in Nigeria, are among the ideas that have won funding in a competition for developing countries. Twenty-six projects were selected for "100 Ideas to Save the Planet", this year's Global Development Marketplace competition, which sought ideas for protecting developing countries from climate change.

The US$5 million competition was cosponsored by the World Bank and the Global Environment Facility (GEF), among other institutions. Winning ideas receive up to US$200 000 in seed money, and technical support and guidance on putting the ideas into practice.

In Ecuador, INBAR will build 500 elevated houses that should be resistant to flooding as water flows underneath them. "With the funds we will provide an innovative technology to improve the design, durability and resistance of houses traditionally built with bamboo in the area of Guayaquil," Álvaro Cabrera, regional coordinator of INBAR for Latin America and the Caribbean, told SciDev.Net. For example, roofs will be built from resin and bamboo instead of zinc, and concrete stilts will be used to extend the life of the houses from the current three to five years to around 30 years. (*Source*: SciDev.Net, 2 December 2009.)

Bamboo as carbon sink – fact or fiction?

Bamboo is often considered as a plant with an extraordinary potential for carbon sequestration and therefore for mitigating climatic change. A recent paper by Prof. Liese presented at the VIII World Bamboo Congress (*see page 66 for more information*) argues that bamboo is not likely to be significantly better than trees, and that much more research is needed to establish the true potential of bamboo for carbon sequestration.

For example, the assumption of bamboo's high sequestration potential is derived mainly from the fast growth of the individual culm during its expansion phase. However, the impressive biomass of such a young culm does not originate from its own photosynthesis, but derives from the energy produced by older culms in previous years and stored as carbohydrates in their culms and rhizome system. At the beginning of the growth season this energy will be mobilized and transported to the growing culm.

The individual culm has a limited lifetime of seven to ten years, and thereafter its biomass and the carbon contained will be deteriorated biologically into its origins, among them also CO_2, released into the atmosphere. Furthermore, the gregarious flowering of some species, often worldwide and followed by their death, can constitute massive CO_2 production. On the other hand, prolonged sequestration of carbon is provided through the great variety of bamboo products that range from the manifold constructions to pulp; many of these uses serve the daily needs of over 1.5 billion people.

Although the carbon sequestration of bamboo forests is not likely to influence the mitigation of global warming as much as some protagonists have been arguing, the importance of bamboo forests and plantations for an environmentally friendly and sustainable production of food, fibre and energy, and their environmental services, including soil stability and wastewater management, important for adaption to climate change, are undisputed.

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We have not yet reached the goal but ... we shall soon, with the help of God, be in sight of the day when poverty shall be banished from this nation.

Herbert Clark Hoover

"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)

ACACIA TREE CAN BOOST CROPS ACROSS AFRICA

Nairobi. African farmers could triple yields by planting a type of acacia tree that sheds its nitrogen-rich leaves in time for the growing season alongside their crops.

The fast-growing, hardy species, *Faidherbia albida*, which has common names including apple-ring acacia and *ana* tree, also has a wide range of other benefits, according to Dennis Garrity, Director General of the World Agroforestry Centre in Nairobi, Kenya. "Besides organic fertilizer and livestock fodder for farmers, it also acts as a windbreak, provides wood for fuel and construction and cuts erosion by loosening the soil to absorb water during the rainy season," he said at the 2nd World Congress of Agroforestry in Nairobi this week (24 August). "The tree becomes dormant and sheds its leaves during the early rainy season at the time when seeds need fertilizer and regrows them at the beginning of the dry season, so not competing with crops for light," Garrity told SciDev.Net. Planting the trees can nearly triple yields, he says. In Malawi, maize yields under the acacia canopy are 280 percent higher than outside it.

The acacia variety is already grown on farms in western Africa, as well as in Ethiopia, Malawi and the United Republic of Tanzania. But uptake has been minimal in other parts of Africa. Despite 60 years of research and more than 700 scientific publications on *F. albida*, few farmers – especially in parts of eastern and Central Africa – know of its potential.

As Garrity notes, the tree can thrive in a wide range of conditions and is suitable for planting across the continent. He says the lack of knowledge about the acacia highlights a need for research agencies to find more effective ways to reach farmers. Governments must also invest in generating and communicating research, he adds.

Nobel Peace Prize winner Wangari Maathai, founder of the Green Belt Movement in Kenya, says that the lack of extension services that tap into agroforestry science from research institutions and universities and then pass information to smallholders is a great disservice to the quest for food security in Africa. There is a pressing need to communicate research findings to farmers in languages they can understand, Maathai says. (*Source*: AllAfrica.com, 27 August 2009.)

AFRICAADAPT LAUNCHES NEW FUND FOR INNOVATIVE KNOWLEDGE SHARING

Africa's poor and vulnerable communities rarely have the opportunity to share their valuable experience and learn from others in broader or more formal exchanges of knowledge on climate change adaptation. AfricaAdapt is launching its new Knowledge Sharing Innovation Fund promoting new ways of sharing knowledge that can help address this problem.

The Fund will offer grants of up to US$10 000 to projects that seek to overcome barriers to share knowledge with "hard to reach" or marginalized African communities. These barriers may be related to language, access to information and marginalization through gender or disability.

Ensuring that vulnerable communities are active in the exchange of African knowledge, best practices and expertise on climate change adaptation is a high priority for AfricaAdapt. These communities are the most directly threatened by climatic impacts yet they also have a wealth of experience in adapting to past changes that could benefit other communities.

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ARE NTFPS A WAY OUT OF POVERTY?

Over the last 30 years, policy-makers and conservation NGOs have focused on the sustainable production and commercialization of NTFPs. Is this a way forward in tropical forested areas for successful conservation and rural development?

Development strategies try to include local people in the management and governance of natural resources such as forests, so that they receive more of the benefits. This contrasts with preservationist environmental policies, which excluded people from forests. Strategies that support the collection and commercialization of NTFPs by local people have the potential to provide an increased source of income for people living in or near forests.

NTFPs also have important subsistence uses, for example by providing a "free" source of food, medicines, fuel and construction materials. And, if properly managed, NTFPs can be an incentive for forest communities to protect existing forests and restore degraded areas, to ensure their source of income is sustainable.

However, forests are being cleared as the global demand for timber rises and as ranching and large-scale agricultural activities expand. Many species fundamental to forest livelihoods are vulnerable and forest resources are declining.

This has alarming consequences for subsistence use and local trade. For example, between 1970 and 1990, the number of species extracted by the timber industry in the eastern Brazilian Amazonia rose from fewer than 20 to over 300. At least one-third of the 300 also had value for local people as food, medicine or fuel.

While dramatic landscape change takes place across many developing countries, the sustainable production of many NTFPs is under threat. Policy-makers and development practitioners need a better understanding of the changing role of forest resources for local livelihoods.

In a recent issue of *insights*, scientists working with NWFPs have identified some fundamental policy and management issues.

Marketing NTFPs is an important conservation and development strategy. It can add economic value to forested areas without cutting trees while providing local people with a sustainable, productive activity. For this to happen, researchers and policy-makers must collaborate to make community-based forest management initiatives socially and economically viable.

Elaine Marshall argues that NTFP commercialization is only successful where it is transparent, equitable and sustainable, with a positive impact on poverty reduction, gender equality and resource access, tenure and management. This is more likely if:

- producers, processors and traders collaborate with each other and realize the need for continuous innovation to add value to existing NTFPs and explore new markets; and
- there is external support from market intermediaries (such as governments, international agencies and the private sector) to support producers and traders in overcoming the barriers to entering markets, including legislative constraints, the inconsistent quality and quantity of products, and the lack of market information.

Policy frameworks for the production and commercialization of NTFPs are rarely compatible with forest peoples' situations, however. Getting information and credit depends on appropriate access to transport and communications infrastructure, which are deficient in forest areas. Patricia Shanley gives the inspiring example of the *Frutiferas* (Fruit trees of the forest in the lives of Amazonians) book, which is improving access to reliable and useful information on NTFPs in Brazil. NTFPs are rarely sufficient in themselves to support households but often play a central role during "hungry" seasons.

Reflecting on wildlife products in Equatorial Guinea, Sophie Allebone-Webb, Guy Cowlishaw and J. Marcus Rowcliffe show that the rational extraction and use of NTFPs can improve livelihoods for different forest groups. While bushmeat hunting is predominantly a male activity, for example, the increased marketing of forest plants can increase women's opportunities to earn income.

The collection, processing and trade of NTFPs should encourage forest populations to use their traditional knowledge to help preserve existing forests and reforest degraded areas. Yet most forest people have poor access to markets, insufficient capital to invest in improving their livelihoods, and little or no bargaining power when selling their products in markets.

Jean-Laurent Pfund argues that it is important to understand how market chains operate, from harvesting to the end market. This helps identify obstacles and understand which stages have the most potential to benefit poor people. A fairer trade environment for everyone involved in market chains is crucial.

Fat from sal seeds, for example, has enormous economic potential in India for export and domestic markets. Increasing their collection could increase the incomes of approximately 30 million forest dwellers. Sanjoy Patnaik shows, however, that the legal framework for supplying this product does not support poor people who collect seeds. In contrast, a recent policy in Brazil that set minimum prices for ten NTFPs promises to secure minimum trading conditions for local producers.

Susann Reiner uses evidence from South America to identify further constraints to NTFP-based livelihoods. Merely gathering NTFPs rarely generates enough revenue to sustain the households harvesting them. Lacking direct access to markets, they depend on intermediaries to sell their products, thus reducing their share of the income. Processing locally gathered NTFPs could add value and contribute to poverty alleviation and the sustainability of NTFPs.

Dependence on a single NTFP can be a problem, increasing people's vulnerability caused by variations in yield, market demand and prices. Overharvesting is also common where harvesters depend on one resource. This can leave people without their only source of subsistence; it can also threaten local biodiversity. Kaspar Schmidt provides a compelling example of the risks facing farmers in Kyrgyzstan, dependent on uncertain walnut harvests.

NTFPs rarely provide a pathway out of poverty because poor people have limited access to the assets needed to exploit them, such as rights to use resources, information, financial capital or credit to invest in harvesting, production, processing, transport and marketing. They also lack political capital to influence policies; social capital or opportunities to work together to increase their bargaining power; and physical capital such as processing equipment, storage facilities and transport infrastructure.

Developing NTFP markets can offer sustainable alternatives for forest areas. Strategies need to address a range of issues.

- Women and men play different roles in NTFP market chains and benefit in different ways. A gendered analysis is important in supporting households dependent on forest resources.
- NTFP initiatives must make existing forests more or as profitable as the economic activities that threaten forest areas, such as cattle ranching or logging.
- Scientific evidence needs to merge with traditional knowledge to provide a better understanding of the socio-economic and ecological environments in which NTFPs are used.
- Developing NTFP market chains will require investing in other areas such as access to credit, transport and training in sustainable forest management, including the collection, processing and trade of NTFPs.

(*Source*: Editorial by Mônica Barroso. 2009. *Are NTFPs a way out of poverty?* id21 insights 77, May. Brighton, United Kingdom, id21, Institute of Development Studies at the University of Sussex.)
Download: www.eldis.org/go/topics/insights/2009/

BEER BREWED WITH NTFPS PROMOTES FORESTRY CERTIFICATION

An Italian brewery has become the first to carry the Programme for the Endorsement of Forest Certification (PEFC) label on a beer. Brewer Gino Perisutti's Blonde PEFC Mountain Pale Lager contains spruce bark, mountain pine buds and Scots pine needles from PEFC-certified forests. It was officially launched at the PEFC National Members' meeting in Geneva.

"While NWFPs play only a minor role in forest certification, they are testimony to the passion of alpine forest owners, who also distil PEFC-certified *mugolio* oil from dwarf pine," said Antonio Brunori, PEFC Italy's Secretary General. "Moreover, such products offer great potential to communicate the value of responsible forestry to the public." (*Source: The Timber Industry Magazine*, 1 July 2009.)

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(*Dr Brunori is the author of the guest article in this issue of* Non-Wood News.)

BIOPROSPECTING/ BENEFIT-SHARING OR BIOPIRACY?

India in talks with the United States of America for granting access to TK data to curb biopiracy

After sharing its database of the Traditional Knowledge Digital Library (TKDL) with European countries, India is now in talks with more countries, including the United States of America, for a similar agreement to grant access to these details in a bid to prevent wrong patents across the world on Indian medicinal plants.

Talks with the United States Patent and Trademark Office (US PTO) are in an advanced stage and the agreement will soon be concluded. Likewise, the authorities are also negotiating with other countries such as Japan and China so that it becomes a "win-win" situation for all sharing countries, said sources at the National Institute of Science Communication and Information Resources (NISCAIR).

In February 2009, India granted access to TKDL to the examiners at the European Patent Office (EPO) to prevent attempts at patenting existing traditional knowledge and to curb biopiracy. Sources said the trend of giving wrong patents has decreased, especially after India successfully set up TKDL. In a study carried out in 2000 by the TKDL task force, as many as 4 896 patent references were found on medicinal plants at the international level. This figure increased to15 000 in 2003, and to 35 587 in 2005.

As a consequence of successfully fighting the wrong patents granted at the US PTO on turmeric (*Curcuma longa*) and at the EPO on neem (*Azadirachta indica*), TKDL was created, since fighting incorrect patents was expensive and time consuming. TKDL establishes prior art for approximately 2.04 lakh formulations transcribed in five international languages – English, French, German, Spanish and Japanese – and prevents the granting of wrong patents, if claimed at the international patent offices.

TKDL is a joint venture between five agencies, including NISCAIR and the Council of Scientific and Industrial Research (CSIR). The vast database includes 54 authoritative textbooks on Ayurvedic medicine, nearly 150 000 Ayurvedic, Unani and Siddha medicines and 1 500 physical exercises and postures in yoga, more than 5 000 years old.

TKDL allows examiners to compare patent applications with existing traditional knowledge. New patent applications need to demonstrate significant improvements and inventiveness compared with prior art in their field. TKDL is so precise that it lists the time, place and medium of publication for prior art. This new catalogue system, called the Traditional Knowledge Resource Classification (TKRC), ensures meticulous documentation.

More countries across the globe are also framing such databases and sharing with other countries. In 2008, the Chinese patent office (SIPO) granted the EPO access to its 32 000-entry database on traditional Chinese medicine. (*Source*: Pharmabiz.com [India], 2 November 2009.)

Medicinal plants face greater risk of biopiracy in Thailand after H1N1 outbreak

Biodiversity advocates are warning the Department of Intellectual Property to tread carefully in granting patents to foreign firms to make flu drugs from Thai herbal plants, especially the well-known *fah talai jon* (*Andrographis paniculata*).

The number of patent applications to extract *fah talai jon* chemical substances by foreign researchers has risen dramatically after the outbreak of type A (H1N1) flu earlier this year, said Witoon Lianchamroon, Director of Biothai, a non-profit organization working on biodiversity conservation. The Institute of Thai Traditional Medicine says clinical studies on *fah talai jon* show that it is effective in easing flu symptoms such as sore throats and diarrhoea. Mr Witoon said granting patents for herbal medicines or production methods to foreigners would limit chances for Thais to make use of the medicinal plant.

Patenting the chemical extract of *fah talai jon* would only repeat the mistake of the *plao noi* incident, in which Japanese pharmaceutical firms patented medicinal ingredients and methods of extraction for the herb.

"The department must check carefully whether any patent application breaks the international biological diversity treaty and Thailand's 1999 Plant Varieties Protection Act," Mr Witoon said. "Although *fah talai jon* is not found only in Thailand, countries possessing the precious herb should work together to protect their rights from biopiracy."

The Intellectual Property Department said it had received a number of applications from abroad to patent activities for developing herbal plants, including *fah talai jon*, red onion, ginger, *plai* and *ya nguang chang* (Indian heliotrope).

Supaporn Pitiporn, Head of Pharmacy at the Chaophaya Abhaibhubejhr Hospital in Prachinburi, which is famous for developing herbal medicines, said it was difficult for Thai researchers to get patents because of their limited knowledge. (*Source: Bangkok Post*, 28 July 2009.)

Peru's patent win strikes blow against biopiracy

Peru has prevented several foreign companies from taking out patents on products by demonstrating that they were developed using Peruvian traditional knowledge.

Over the past few months, the Peruvian National Commission against Biopiracy has shown authorities from France, Japan, the Republic of Korea and the United States of America that products submitted for patents were developed using the traditional knowledge of Peruvian people. It showed that the products lacked the innovation and inventiveness required for patents.

"This is a good example of how coordinated action between the state, the business sector and civil society can prevent inappropriately granted patents related to genetic resources and traditional knowledge," Andrés Valladolid, technical coordinator at the Commission, told SciDev.Net.

The products are derived from *Lepidium meyenii, Plukenetia volubilis* Linn. and *Myrciaria dubia* – three plants well known among indigenous Peruvian populations for their medicinal properties.

The Commission monitors 69 Peruvian genetic resources on databases at the world's main patent offices. "We don't want

to forbid companies from using our genetic resources or traditional knowledge – but they have to reward the indigenous people fairly," Valladolid says. (*Source*: SciDev.Net Weekly Update, 13–19 July 2009.)

BLENDING INDIGENOUS KNOWLEDGE AND MODERN TECHNOLOGY

Strengthening indigenous peoples' knowledge systems and blending them with appropriate modern technology can enhance livelihood options, revitalize agriculture, increase food security and improve health. Indigenous peoples' knowledge about medicinal plants or underutilized plant species has been used and capitalized on with very powerful effects both in local programmes and by promoting fair national and international value chains, always with the participation of local communities, governments, donors and other partners such as the private sector and NGOs.

In the Indian state of Andhra Pradesh, modern techniques and tribal knowledge have been brought together to develop innovative NTFPs, such as gum karaya, clearing nut, neem and others. Within a short period, the quality of the gum karaya improved and prices rose by up to 250 percent, while four value-added by-products were developed: powder, granules, cream and gel. The gum karaya initiative was a major source of income for about 12 000 tribal people and an important source of employment for tribal women.

Indigenous peoples' knowledge, especially that of indigenous women, may hold the key to increased food security, adaptation capability, protection of natural resources, disaster prevention and other challenges related to climate change. (Source: IFAD Policy on Engagement with Indigenous Peoples; EB 2009/97/R.3.)

CINDERELLA FRUIT: WILD DELICACIES BECOME CASH CROPS

If you had come here ten years ago, says Thaddeus Salah as he shows us round his tree nursery in northwest Cameroon, you would have seen real hunger and poverty. "In those times," he says, "we didn't have enough chop to eat". It was not just food – "chop" in the local dialect – that his family lacked. They could not afford school fees, health care or even chairs for their dilapidated grass-thatch house.

Salah's fortunes changed in 2000 when he and his neighbours learned how to identify the best wild fruit trees and propagate them in a nursery. "Domesticating wild fruit like bush mango (*Irvingia gabonensis*) has changed our lives," he says. His family now has "plenty chop", as he puts it. He is also earning enough from the sale of indigenous fruit trees to pay school fees for four of his children. He has been able to re-roof his house with zinc sheets and buy goods he could only dream of owning before. He even has a mobile phone.

From Salah's farm we gaze across the intensively cultivated hills that roll away towards the Nigerian border. "Ten years ago, you'd hardly see any *safou* (*Dacryodes edulis*) in this area," says Zachary Tchoundjeu, a botanist at the World Agroforestry Centre's regional office in the Cameroonian capital, Yaoundé. "Now you see them growing everywhere."

The spread of African plum throughout these hills is one small part of a bigger movement that could change the lives of millions of Africans. The continent is home to some 3 000 species of wild fruit trees, many of which are ripe for domestication. Chocolate berries, gingerbread plums, monkey oranges, gumvines, tree grapes and a host of others could soon play a role in ensuring dependable food supplies in areas now plagued by malnutrition.

Rural Africans consume an enormous variety of wild foodstuffs. In Cameroon, fruits and seeds from around 300 indigenous trees are eaten, according to a study by researchers at Cameroon's University of Dschang. A similar survey in Malawi and Zambia found that up to 40 percent of rural households rely on indigenous fruits to sustain them during the "hungry months", particularly January and February, when supplies in their granaries are exhausted and they are waiting for their next harvest.

Some of these so-called "famine foods" have already been domesticated by accident, says ethnoecologist Anthony Cunningham of People and Plants International, an NGO based in Vermont, United States of America. He cites the example of *marula* (*Sclerocarya birrea*), a southern African tree in the cashew family with edible nutty seeds encased in a tart, turpentine-flavoured fruit. "Long before the development of agricultural crops, hunter-gatherers were eating *marula* fruit," he says. "They'd pick the best fruit, and then scatter the seeds around their camps." These would eventually germinate and mature into fruit-bearing trees, ensuring, in evolutionary terms, the survival of the tastiest. *Marula* is now fully domesticated and the fruit is used to make juice, a liqueur called Amarula cream and cosmetic oils.

"If you come back here in ten years' time, I hope – I'm sure – you'll see improved varieties of indigenous fruit trees on every smallholding," says Tchoundjeu. "I think you'll see a great diversity of different tree crops and a much more complex, more sustainable environment. And the people will be healthier and better off." (*Source: New Scientist*, 10 November 2009.)

DEVELOPMENT AGENCIES CALL FOR INDIGENOUS PEOPLE TO PLAY A ROLE IN FOREST MANAGEMENT

A new report calls on industrialized countries to ensure financial support to efforts to conserve and manage forests. The report says indigenous people in Asia should play a key role in forestry, to help reduce greenhouse gas emissions.

The report by the conservation group Forests Dialogue says indigenous communities must be involved in decisions about managing forests in the Asia-Pacific region.

The loss of forest cover globally amounts to as much as 13 million ha/year. Deforestation is a prime contributor to greenhouse gas emissions, largely CO_2, which scientists say contribute to global warming.

The report was unveiled on the sidelines of United Nations climate talks in Bangkok on Thursday. The meetings here are to pave the way for a global agreement on cutting greenhouse gas emissions and preparing for climate change, which is to be drafted in Copenhagen in December.

"Drawing from our experience over many difficult situations around the world, and if we've learned anything in the last 25 or 30 years, it is that we really need to be very thorough and effective in involving local people, local stakeholders in forestry management," said Patrick Durst, an FAO forestry official. "Without that, we certainly set ourselves up for failure."

The United Nations has introduced the programme on reducing emissions from deforestation and forest degradation, or REDD. Working with various UN agencies, the programme hopes to create a system in which industries or nations that produce large amounts of greenhouse gas can offset that by paying other nations to protect their forests.

Pilot projects have begun in Papua New Guinea, Indonesia and Viet Nam. In Nepal, under a government-backed programme, more than 14 000 forest user groups have regenerated over 1.25 million ha of degraded forest area in the past decade.

The Forests Dialogue group asks that developed nations robustly fund the REDD programme and make sure that the money goes to the forest people who need it.

Vicki Tauli-Corpuz, who heads the UN Permanent Forum on Indigenous Issues, says the REDD strategy will not work unless forest communities are involved. "The key challenges in implementing REDD are really the involvement of the indigenous people and the local communities in making decisions about REDD and in receiving benefits from REDD," Tauli-Corpuz said. "I mean all of the measures in relation to forests are really very centralized. If you cannot deal with that, I don't think it is really going to succeed."

The United Nations is trying to establish an international REDD finance mechanism to be included in any global climate agreement drafted in Copenhagen in December. (*Source*: Voice of America, 1 October 2009.)

FAIRWILD FOUNDATION

Established in 2008, the FairWild Foundation promotes the sustainable use of wild-collected ingredients, with a fair deal for all those involved throughout the supply chain.

The increasing demand for wild plants – as ingredients for food, cosmetics, well-being and medicinal products – poses major ecological and social challenges. The pressure on potentially vulnerable plant species can endanger local ecosystems and the livelihoods of collectors, who often belong to the poorest social groups in the countries of origin.

As a response to these concerns, the FairWild Foundation promotes the FairWild Standard and certification system for the sustainable management and collection of wild plants.

FairWild Certification means that buyers know they are supporting fair trading – the products are legally and sustainably sourced, and the benefits are felt by all those involved right down to the local communities harvesting the wild plants. Products that can be certified include those collected from the wild (e.g. medicinal and aromatic plants, berries, wild fruits, nuts and seeds, mushrooms and honey), and raw materials for finished products (e.g. essential and fatty oils).

The FairWild Standard assesses the harvesting and trade of wild plants against various ecological, social and economic requirements. Use of the FairWild Standard helps support efforts to ensure plants are managed, harvested and traded in a way that maintains populations in the wild and benefits rural producers. The FairWild Standard is also proving instrumental for the implementation of existing regulatory frameworks provided by National Resource Management Systems as well as by international conventions such as the Convention on Biological Diversity (CBD) and the Non-Detriment Findings Process of CITES (Convention on International Trade in Endangered Species of Wild Fauna and Flora).

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GENDER DIMENSIONS OF FOREST MANAGEMENT

Rural women and men often have disparate knowledge of forest resources and different roles in tree and forest management. Women practise traditional agroforestry production systems, such as home gardening, and harvest and sell wood and tree products as part of small-scale enterprises. They are mainly responsible for collection of fuelwood for the household, and for wild plants used as food and medicines. Men are involved more in high-value activities such as cutting and hauling timber.

But gender roles vary – in parts of Nepal, men weave bamboo baskets, while in the Lao People's Democratic Republic, women are more active in the craft. Women are the sole collectors of fuelwood in Bhutan, but men help out in Sri Lanka. Research suggests that trees and forests are more important to rural women's livelihoods than to those of men. In Madagascar, poor women in one community earned 37 percent of their income from forest products, compared with 22 percent earned by men. In Andhra Pradesh, 77 percent of women's income in some areas was derived from forests. In many countries, forest land is owned by the state, while local men have rights to trees and women to tree products such as fruit. On Pacific islands, women harvest breadfruit for food, but breadfruit trees are controlled by men, who use the timber to make furniture. For both men and women, access to forest resources is becoming complex, as rights based in negotiable customary law give way, increasingly, to government action to protect threatened forest habitats by restricting human encroachment.

Restrictions on access affect men and women in different ways. In sub-Saharan Africa, responsibility for caring for household members afflicted by HIV/AIDS falls mainly on women, leaving less time for agricultural production. As a result, they are becoming more reliant on forest foods and income from fuelwood. During conflicts and natural disasters, displaced rural people also become more reliant on forest products and services. Given their responsibility for meeting household food and fuel needs, depletion of forest resources especially increases burdens on women. A study in Malawi found deforestation was forcing elderly women to walk more than 10 km a day to collect fuelwood. Women spend on average 800 hours a year in Zambia and 300 hours a year in the United Republic of Tanzania on the same task. In East Africa, fuelwood scarcity has led to a reduction in the number of meals cooked in poor households. (*Source: Bridging the gap*. 2009. FAO's Programme for Gender Equality in Agriculture and Rural Development.)

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GESTION DE LA FAUNE SAUVAGE ET DE LA NATURE EN AFRIQUE: ÉVOLUTION ET SUCCÈS

La plupart des espèces «sensibles» de faune et de flore en Afrique ont toujours bénéficié d'une certaine forme de protection: celle-ci advient à travers le système des totems, lesquels pourraient être assimilés à des liens de sang entre certaines espèces et des patronymes ou des clans. A ce titre, ces derniers se doivent de protéger cet animal, de ne jamais manger sa chair, et de faciliter en tout temps sa survie. Pendant les dernières années de la colonisation et surtout au cours des décennies qui ont suivi les indépendances, du fait d'administrations inexpérimentées et mal outillées sinon inexistantes, la faune sauvage africaine a subi un massacre systématique de la part de braconniers mieux équipés que la plupart des armées nationales, et qui bénéficiaient de filières très organisées leur assurant richesse et impunité. Ce pillage a été aggravé par la destruction massive des habitats issue de divers facteurs: l'exploitation forestière; la collecte du bois de feu; et le défrichement de nouvelles terres agricoles, effectué tant pour répondre à des besoins de subsistance que pour instaurer de vastes étendues de cultures commerciales.

C'est dans ce cadre que, dans les années 70, la Commission des forêts pour l'Afrique a décidé de créer un groupe de travail sur la faune sauvage et les parcs nationaux, changeant ainsi de nom pour devenir l'actuelle Commission des forêts et de la faune sauvage pour l'Afrique: il s'agissait par là de bien marquer l'égale importance accordée par les pays d'Afrique aux forêts et à la faune sauvage. Cela a donné lieu à l'avènement d'initiatives telles que le projet CAMPFIRE au Zimbabwe, un programme de gestion communautaire des ressources indigènes qui a permis à plus de 80 pour cent des communautés rurales d'améliorer notablement leurs conditions de vie, grâce à l'écotourisme et à la gestion de la faune sauvage. Au Ghana, un petit projet de la FAO a contribué à assurer les moyens d'existence et la sécurité alimentaire des agriculteurs autour de la zone de conservation de Kakum, en mettant au point des techniques simples pour tenir à distance des cultures les éléphants, dont les incursions fréquentes détruisaient régulièrement toutes les récoltes.

Les conflits potentiels entre la présence de la faune et les activités humaines sont encore loin d'être bien cernés, de même que la question de la gestion des aires protégées dans le contexte de l'aménagement global de l'espace rural. C'est pourquoi il convient plus que jamais de renforcer les échanges et la coopération régionale, en particulier à travers des mécanismes et des instruments appropriés: tout d'abord le Groupe de travail sur la gestion de la faune sauvage et des aires protégées relevant de la Commission des forêts et de la faune sauvage pour l'Afrique, mais aussi des revues telles que *Nature et Faune*. Il faudrait également une plus grande intégration de la dimension faune dans les programmes et projets forestiers en Afrique. (*Source*: FAO. 2008. Gestion de la faune sauvage et de la nature en Afrique: évolution et succès. Dans *Nature et Faune*, 23[2].)

LAWS AND POLICIES FOR SUSTAINABLE AND EQUITABLE NTFP USE

People have long developed and depended upon species from diverse ecosystems. Products from the wild, known as NTFPs, are used by communities around the world as medicines, cosmetics, drinks, foods, decorations and for a multitude of other purposes. They contribute substantially to rural livelihoods, generate revenue for companies and governments, and have a range of impacts on biodiversity conservation. Despite wide variations in cultural, economic and political conditions, experiences with NTFP law and policy are remarkably similar around the world. Nevertheless, there is little information available to those seeking to develop effective policy frameworks and regulation.

A new policy brief draws from the book *Wild product governance: finding policies that work for non-timber forest products*, to be published in 2010 by Earthscan as part of the People and Plants Series (www.peopleandplants.org). Based on case studies from the Plurinational State of Bolivia, Brazil, Cameroon, Canada, China, Fiji, Finland, India, Mexico, the Philippines, southern Africa, the United States of America and the United Kingdom, the brief addresses a number of key issues aimed at a more sustainable and equitable use of wild forest products. It looks at economic factors, the interface between traditional and scientific knowledge, and relationships between NTFP regulation, land tenure and resource rights, as well as power and equity imbalances. The need to reflect the commercialization and heterogeneity of

"NTFP policies work best when based on incentives ('carrots') rather than penalties ('sticks')."

NTFPs, markets and stakeholders in policies and laws, for example, is stressed.

The authors also highlight the need for NTFP regulation to be part of an entire pattern of land uses and regulation. Moreover, given that climate change will probably bring substantial shifts in the geographic distribution of most plant species, climate change mitigation and adaptation strategies and policies ought explicitly to include NTFP harvesting and trade among activities for which supportive actions are required, argue the authors. (*Source*: Sarah A. Laird, Rebecca McClain and Rachel Wynberg. October 2009. *Laws and policies for sustainable and equitable non-timber forest product use*. United Nations University, Centre for International Forestry Research, People and Plants International, Environmental Evaluation Unit, University of Cape Town, and the Institute for Culture and Ecology.)

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LOCALIZING PRODUCTS: A SUSTAINABLE APPROACH FOR NATURAL AND CULTURAL DIVERSITY IN THE SOUTH?

A scientific symposium to explore the links between biological and cultural diversity and the processes designed to enhance the value of local specialities in countries in the South took place in Paris, France from 9 to 11 June 2009. Organized by UNESCO/Mab (United Nations Educational, Scientific and Cultural Organization/Man and the Biosphere), IRD (Institute of Research for Development), CIRAD (International Cooperation Centre of Agricultural Research for Development) and MNHN (French National Natural History Museum), in collaboration with the French Foundation for Research on Biodiversity (FRB), FFEM (French Fund for World Environment),

AFD (French Development Agency) and IDDRI (Institut de développement durable et des relations internationales), the event united 175 participants from around the world, including experts from various scientific disciplines, international and national organizations and NGOs. The conference provided an opportunity to exchange knowledge between North and South.

The agenda centred upon three main workshops, with many of the sessions covering NWFPs, e.g. constructing the identity of products (names, images, typicality, reputation); valuing local products in the frame of conservation politics; valuing local products and the potential impacts on biodiversity; and social and territorial changes linked to the value of local products.

"Every product produced in developing countries, including sorghum, quinoa, coffee, argan oil, red tea and even cheese, has a local and cultural identity. They come from specific ecosystems, parks or protected areas. Does promoting these products help to maintain biodiversity?" asked Martine Antona, a researcher at CIRAD and member of the Conference Organizing Committee. Participants at the conference explored the issue extensively.

Thirty-five studies were presented in the three parallel workshops. One study carried out in the Western Ghats, India, in Kodagu district, a major coffee-growing region, investigated the potential of geographic indications (GIs) in protecting the environment through the protection of cultural and biological diversity. (GIs identify goods as originating in a country, region or locality, where a given quality or characteristic of such goods is essentially attributable to its geographic origin.) Given that the intensification of coffee cultivation has led to a 30 percent loss in forest cover in the region, the paper explores how local producers can successfully use GIs and the conditions needed for them to have a positive impact on biodiversity conservation. Another study explored the challenges and opportunities of biotrade and green markets in the Colombian Amazon region, citing the example of native chilli peppers, a species widely used by indigenous groups in the area.

Bernard Roussel, a lecturer at MNHN and member of the Conference Organizing Committee, says it is necessary to set up structures that would enable players at local level to draw maximum benefit from current globalization patterns, in which cultural factors are playing an ever greater role in economic rationales and the idea of origin is increasingly a guarantee of quality. If sociocultural change is the main cause of agrobiodiversity degradation, argued the authors of a study carried out in the Peruvian Andes, it might also be a fundamental source for its conservation.

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PROTÉGER LA FORÊT ET SES TRADITIONS GRÂCE À LA CERTIFICATION COMMERCIALE? UNE ÉTUDE SUR L'AMAZONIE BRÉSILIENNE

Cette étude a été présentée au colloque international «Localiser les produits: une voie durable au service de la diversité naturelle et culturelle des Suds?» (9–11 juin 2009, UNESCO, Paris).
Comment la valorisation de certaines espèces typiques d'Amazonie brésilienne peut permettre en même temps la préservation de la sociodiversité? A partir de l'exemple de trois communautés insérées dans des aires protéges de cette région et des instruments de valorisation mis en place en parallèle (certification officielle ou spontanée, indication géographique, etc.), les auteurs cherchent à voir quelles sont les avancées obtenues dans ces domaines. Si l'écocertification assure le maintien de la forêt dans son intégrité, elle perturbe la transmission des savoirs traditionnels en interdisant le travail infantile. Pour les indications géographiques et autres labels plus ou moins officieux, la dimension environnementale demeure dépendante du bon vouloir des populations, lesquelles auront tendance à privilégier l'aspect social (reconnaissance identitaire ou politique) ou économique (plus-value), au détriment de la préservation de la biodiversité sauvage ou domestique. (*Source*: Anna Greissing, Guillame Marchand et Stephanie Nasuti. Communication: «Protéger la foret et ses traditions grâce à la certification commerciale? Trois exemples en aires protéges d'Amazonie brésilienne».)

NON-PROFIT ORGANIZATIONS AND NGOS

Crops for the Future

Crops for the Future is a small international non-profit organization working to promote underutilized crops for the benefit of the poor and the environment. Its focus is the collection, synthesis and provision of information and knowledge about neglected and underutilized plant species and their current and potential roles in people's livelihoods and the environment.

Crops for the Future evolved from the International Centre for Underutilised Crops (ICUC) and the Global Facilitation Unit for Underutilized Species (GFU) and is hosted by Bioversity International (www.bioversityinternational.org) at its Asia, Pacific and Oceania Regional Office in Serdang, Malaysia in a joint venture with the University of Nottingham Malaysia Campus (www.nottingham.edu.my).

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Food Plants International

Food Plants International is a small non-profit organization seeking to document all the edible plants of the world. Currently its database has over 19 500 edible plant species. They are all being written up in plain English to make the information accessible to those for whom English is not their primary language and who are not scientifically trained. The aim is to "Help the Hungry Feed Themselves".

A Web version containing some of the information is available at www.foodplantsinternational.com/. A series of publications for Papua New Guinea are available to download free. An additional series is being compiled for the Solomon Islands in association with Rotary International and further information is available on their LearnGrow.org Web site.

For those genuinely involved in assisting the rural poor in tropical locations, a more comprehensive DVD version can be provided. Unfortunately, as our

organization is almost a one-person activity working on a voluntary basis and assisted by volunteers, and is basically unfunded, it is not possible to engage in extensive e-mail communication, nor meet too many requests.

There remain a large number of poorly documented and overlooked food plants already adapted to local conditions, and therefore giving more stable and sustainable production; many of these are in tropical countries where undernutrition is a major concern. Often these plants have significantly greater nutritional value than more commonly promoted species from more temperate countries.The long-term aim is to empower people to make good choices about what food plants they grow and use.

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Resources Himalaya

Resources Himalaya is a non-governmental, non-profit organization. We began in 1986 as a private registered research organization because the law at that time forbade the non-governmental movement. By 2004, our collaborative work had reached Bhutan, India and Nepal, which prompted us to establish it as a regional think-tank in the Himalayas. In the last 20 years, our partners have widened our collaborative horizon into agriculture, biodiversity, protected areas and wildlife conservation, forest ecology, community forestry, nature tourism, mentorship, ethnography and social studies. We have garnered regional experience through our collaborative works of over several hundred research projects in Bhutan, India and Nepal.

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PROCESSING AND MARKETING OF NWFPS: POTENTIAL IMPACTS AND CHALLENGES IN AFRICA

A recent paper provides an overview and synthesis of the processing and marketing of NWFPs in Africa. Indeed, NWFPs provide a livelihood support system for forest communities and poor urban households in terms of food, medicines, income and employment. However, forest communities remain poor, always struggling to make a living rather than improving their status quo. This trend raises concern as to whether NWFPs constitute a poverty trap, a safety net or a resource for rural development and poverty alleviation. The authors try to address some of these concerns with the main objective of drawing lessons from experiences across the African continent on the opportunities and challenges of the NWFP sector. Such lessons are considered very important in informing the development of policies in future that can better contribute and sustain the provision of income and livelihood to stakeholders. Lessons drawn from this analysis show that organized production, processing and marketing of NWFPs can increase the revenue of dependent communities, thereby contributing to poverty reduction in Africa.

The authors conclude that the salient requirements for the development of NWFPs include adding value locally; choosing the right marketing strategy; informing local producers and organizations on legal procedures; supporting and building capacities of vibrant/accountable local organizations; conducting cost-effective research and development; and disseminating appropriate information on the resource base and on market conditions. (*Source*: Tieguhong Julius Chupezi, Ousseynou Ndoye, Mathurin Tchatat and Ben Chikamai. 2009. Processing and marketing of non-wood forest products: potential impacts and challenges in Africa. (abstract.) In *Discov. Innov.*, 21 [SFM Special Edition No. 1]).

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PROTECTING FORESTS TO PRESERVE THE MEDICAL KNOWLEDGE OF RAIN FOREST SHAMANS

Deep in the rain forests of Suriname, indigenous shamans of the Trio tribe possess a healing prowess unappreciated by Western medicine, says a recent study published in the *Journal of Ethnobiology and Ethnomedicine*. Lead author Christopher Herndon, a physician at the University of California, San Francisco, says: "Our paper contests a prevailing view in the medical establishment that we, as scientists, have nothing left to learn from so-called 'primitive' societies". The research, based on data from more than 20 000 patient visits to traditional clinics over a four-year period, finds that shamans in the Trio tribe have a complex understanding of disease concepts, comparable with Western medical science. These indigenous shamans recognize some 75 distinct disease conditions – from common ailments such as fever (*këike*) to rare medical conditions such as Bell's palsy (*ehpijanejan*). They can distinguish between endemic and newly introduced illnesses.

Shamanism is a product of accumulated knowledge from past generations, combined with deep spiritual and physical ties to the natural environment. The knowledge and treatments of shamans are products of their own scientific method, accumulated from a progressive cycle of trial, experiment and observation repeated over countless generations. In many ways, shamanism is fundamentally based on the very same empirical and pragmatic principles as Western science.

The destruction of forests, however, is threatening the valuable knowledge of

indigenous Shamans. Written inventories of Trio medical knowledge alone will not suffice to "save" these medical practices. Trio ethnomedicine is a complex art of diagnosis, examination, communication, ritual and treatment. It can only be transmitted through active practice, says Herndon. It is in part thanks to pioneering efforts by the Amazon Conservation Team (ACT) – a "biocultural" conservation group – that this knowledge is not disappearing altogether. ACT has established a system of traditional health clinics to improve health care and promote medicinal plant knowledge from healers to younger members of the tribe.

"Our 'Western' medical system is itself but a compendium of knowledge, wisdom and therapeutics accumulated from past cultures and societies from around the world," says Herndon. "We should be justifiably proud of the accomplishments of medical science, but at the same time not lose the perspective that these advancements, in many cases, emerged only in the past half century. My point is that we should not be so quick to sever the umbilical cord of our medical system from the womb of the last remaining cultures that helped gave it birth. We do so at our great loss." (*Source*: extracted from: "How rainforest shamans treat disease" in *Amazon News*, 12, November 2009.)

PROTEIN BUSTER FROM COMMON TREE

The rooster tree (*Calotropis procera*) – a tree common across the Indian subcontinent – can yield an enzyme protease (purified from its latex) that has a variety of uses in the food, detergent and pharmaceutical industries. The tree's enzyme is active under temperatures and acidity conditions that make other proteases inactive and is especially good at removing blood stains, the researchers note in their article "Purification of a novel cysteine protease, procerain B, from *Calotropis procera* with distinct characteristics compared to procerain". (*Source*: SciDev.Net Weekly Update, 9–15 November 2009.)

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TREE PLANTING WORLD RECORD

Pakistan has set the Guinness World Record for tree planting, beating India in a healthy and productive international competition contributing to preserving fragile and endangered forests. With 541 176 young mangrove trees planted by 300 volunteers from the local fisherfolk communities in just one day, the country broke the previous 447 874 record held by India. (*Source*: WWF, 16 July 2009.)

USING MODERN TOOLS TO PROTECT BIODIVERSITY

Indigenous peoples protect the rain forest with hi-tech tools

Illegal logging is a threat to the rain forests of Peru. But the indigenous communities are using both ancient knowledge and modern technology to protect biodiversity and stop further destruction.

The lush green of the rain forest offers rich natural resources which the Ashaninka Indians have lived on for centuries. At the Yoreka Atame school of primeval forestry in Brazil, young indigenous and non-indigenous people have been learning how to make use of them in a sustainable way. Since 2007, the school has taught skills to more than 2 000 participants, such as cultivating fruit trees, keeping bees and erecting dams in creeks and lakes to enhance spawning grounds for fish.

"That's how we Ashaninka Indians here in the border region between Brazil and Peru want to pass on our traditional knowledge," said Moises Piyako. He cofounded the Yoreka Atame school together with his brother Benki in 2007.

To prevent illegal loggers from wreaking further havoc on Brazilian territory, Benki and Moises Piyako demand a worldwide ban on imports of wood illegally felled in rain forests. "There are only a few specimens left of many of the tree species, and we are trying to recultivate these economic plants," they said, adding that there is a lack of understanding about the importance of managing sustainable resources. "We must make sure that our natural resources are not destroyed in the struggle for survival."

In their fight for environmental protection, the Ashaninka combine traditional knowledge and modern technology. Some remote communities have already set up satellite-supported communication systems in the rain forest.

In addition, Benki Piyako and his village of Apiwtxa have set up a video blog on life in the rain forest (http://apiwtxa.blogspot.com). There, they also post satellite photos that document how illegal logging is devastating huge areas. It is their aim to teach people how the forest and its resources can be used without destroying them. And they also want to set up a global network supporting the protection of their region. (*Source*: DW-World.de, 10 August 2009.)

Indigenous tribe teams with Google to make a stand in the Amazon

The chief of an endangered Amazon tribe will unveil today the product of an unusual partnership with Google Inc. that pairs high tech with indigenous knowledge in an effort to rescue ancient rain forests and a dying culture.

Almir Surui, speaking at the 20th Annual Bioneers Conference in San Rafael, plans to showcase Google Earth images, years in the making, that throw into sharp relief the rapid encroachment of illegal mining and logging on to his people's 600 000-acre (approximately 242 811-ha) reserve. The data-rich maps include layers of videos, pictures, text and historical markers gathered by tribe members. They promise to underscore the importance of the land and propel the Surui people's efforts to become self-sufficient.

"Right now, under current development models, a standing forest is always worth less than its extractable parts," Chief Almir, 35, a stocky man with a bulldog

head crowned by a feathered Amazon headdress, said through an interpreter.

"Forests are very important for the welfare of the indigenous people and for the world," he said. "We want to show concretely, practically that you can have quality of life and economic development, with an intact forest." The Google Earth updates will become viewable later this week.

The 1 300-member Surui tribe was 5 000 strong in the late 1960s, when it first came into contact with outsiders as construction began on the BR-364 highway through nearby Cacoal, Brazil, about 125 miles (approximately 201.2 km) from the northwest border of Bolivia. The ensuing decades brought disease, crushing poverty and continual clashes with plunderers. The Brazilian Constitution grants indigenous tribes the right to their traditional lands, but the Government has not backed the policy with the necessary resources to halt the incursions, environmental groups allege.

Eleven chiefs of Surui and neighbouring tribes have been shot and killed this decade, deaths that members attribute to loggers and miners and see as clear warnings for others who would obstruct their efforts. Almir, an outspoken activist for nearly two decades and the first member of his tribe to graduate from college, has been cautioned that there is a US$100 000 bounty on his head.

The Amazon Conservation Team of Arlington, Virginia (United States of America), which funded and provided technical equipment for the mapping project, evacuated Almir to the United States for his safety in 2006. The following year, they took him to Silicon Valley to appeal directly to Google for help. The company agreed to provide high-resolution satellite images of the region and train the Surui people to survey their lands and document their culture, using tools such as Google Earth, Google maps, Blogger and YouTube.

The tribe adopted Amazon Conservation Team's methodology for so-called ethnographic mapping, which has been used to chart more than 40 million acres (approximately 16 187 426 ha) of rain forest. Members interviewed their elders, photographed their territory, and plotted out more than 2 000 important sites using GPS (global positioning system) tools, including ceremonial lands, hunting grounds, fishing spots and stands of the three tree types necessary to make their arrows.

"It shows how they use the land, their history on the land, the stories related to each point and also the spiritual side," said Vasco van Roosmalen, Brazil director for the Amazon Conservation Team.

All the data have been embedded into the Google Earth images that Chief Almir will unveil today, and will continue to be updated in the years ahead. The overarching hope is that stark pictures of deforestation's devastation will grab the world's attention and enlist new allies in the Surui's struggles. (*Source*: San Francisco Gate, 18 October 2009.)

Protecting forests with barcodes

Deep in the world's tropical rain forests, workers are hammering thousands of barcodes into hardwood trees to help in the fight against illegal logging, corruption and global warming.

The plastic tags, like those on supermarket groceries, have been nailed to a million trees across Africa, Southeast Asia and South America to help countries keep track of timber reserves.

Helveta, the British company behind the technology, says the barcodes will help firms comply with tough laws on importing sustainable timber into the United States of America and Europe. They could also play a role in fighting deforestation, which accounts for about a fifth of global emissions of planet-warming carbon dioxide. The issue will feature in global climate talks in Copenhagen in December.

The company, which has just secured another £3 million (US$4.88 million) in funding from investors, has put barcodes on trees across the world, including in the Plurinational State of Bolivia, Ghana, Indonesia, Liberia, Malaysia and Peru.

The computerized system is less prone to fraud than traditional paper records, carries live data and can help governments to collect more timber taxes, Helveta said. While the barcodes cannot prevent criminals from chopping down trees, the system makes it hard for them to process, sell or export the wood. (*Source*: Reuters, 10 July 2009.)

Rare gorillas make Facebook debut

Uganda is preparing to make Internet stars of its endangered mountain gorillas. Officials are launching a "Friend a Gorilla" Web site to allow readers – for a US$1 fee – to become friends with the animals on the Facebook site. It is not clear how often the gorillas will update their status.

There are only about 700 of the gorillas left in Africa. They are found on the slopes of the Virunga Mountains on the borders of Rwanda, Uganda and the Democratic Republic of the Congo, where several animals have been killed by armed fighters.

Lillian Nsubuga, of the Uganda Wildlife Authority, told the BBC's Focus on Africa programme she hoped the initiative would raise money for the gorillas and promote Uganda as a tourist destination. "Anybody with an account on Facebook will be able to click on this microsite and get into our Web site," she said. "When they get there, they will find descriptions and faces and all types of photos of the gorillas in Bwindi National Park."

She says readers will be able to work out which particular animal they are fond of.

"If you like him and you choose him, then you pay US$1 and his face will appear on your Facebook page – then in addition to human friends you will have gorilla friends." (*Source*: BBC News, 24 September 2009.) ♣

Don't ever take a fence down until you know why it was put up.

Robert Frost

AGARWOOD

Looking for a faster way to produce *gaharu* in Malaysia

Kuala Terengganu. The state Forestry Department of Malaysia is on the hunt for a local form of inoculation to boost the production and industry of *gaharu*, the resin harvested from agarwood trees (*Aquilaria malaccensis*).

Inoculation of the agarwood or *karas* tree helps accelerate the process of infection, which in turn leads to a better yield of the aromatic resin. Traditionally, harvesters slash the tree for it to become infected. It is estimated that a *karas* tree takes between ten and 15 years to produce *gaharu* but, with inoculation, it takes only between two and three years.

State Forestry Department director Nor Akhirruddin Mahmud said the current vaccines used were costly as they were imported from the United States of America and Thailand, and could only be used selectively. This has slowed the production of *gaharu*, which is mainly used in the perfume trade, although it is also used medicinally as a remedy for nervous disorders such as neurosis, obsessive behaviour and exhaustion.

Two years ago, the price ranged between RM8 000 and 10 000/kg. While the economic value of an adult tree is still being researched here, on average it can yield up to RM18 000/kg after harvesting in Thailand and Indonesia. The *New Straits Times* reported in 2007 that the state is sitting on a goldmine because, in four years time, it stands to earn more than RM500 million in revenue from a 47-ha site at the Merchang forestry station holding 40 000 seedlings.

"Despite the state's huge potential to become a hub for *gaharu* production, we are still lagging behind other countries such as Thailand and Singapore as we have overlooked its economic value. But this does not mean we cannot be part of the industry. That is why we want to come up with a local inoculation which could encourage more participants," Nor Akhirruddin told the *New Straits Times* recently. Currently, the Forestry Department is working closely with the Malaysian Nuclear Institution for a local substance, but is open to other solutions. Nor Akhirruddin said the department was hoping to come up with its own form of vaccine in the next two years.

The department was also trying to encourage people to grow agarwood. (*Source: New Straits Times*, 2 July 2009.)

BRAZIL NUTS (*BERTHOLLETIA EXCELSA*)

Bertholletia excelsa

Brazil nuts are seeds, not nuts

For the past 35 years, research led by Dr Scott A. Mori of the New York Botanical Garden has focused on the classification and ecology of species of the Brazil nut family. The Brazil nut itself is only one of what is estimated to be about 250 species of that family found in the forests of Central and South America. This number includes nearly 50 species that do not have scientific names, mostly because collectors are usually not willing to climb into tall trees to gather the specimens needed to document their existence.

The Brazil nut flower is large, roughly two inches (5 cm) in diameter and fleshy; the male part of the flower has a structure not found in any other plant family in the world. The fertile stamens are arranged in a ring that surrounds the style at the summit of the ovary. This ring has a prolongation on one side that is expanded at the apex to form a hood-like structure. At the apex of the hood are appendages that turn in towards the interior of the flower. A small amount of nectar is produced at the base of these appendages. The fleshy hood presses directly on to the summit of the ovary and the six petals form an overlapping "cup" that blocks entry to the flower to all but the coevolved pollinators.

The Brazil nut is known to be pollinated only by large bees with enough strength to lift up the hood and enter the flower. These bees are presumably rewarded for their efforts by the nectar they collect from the interior of the hood. When the bees are in the flower, pollen rubs off on to their heads and backs from where it is transferred to the stigma of subsequent flowers visited.

For the most part, a Brazil nut tree cannot fertilize itself, so the bee pollinators are needed to carry pollen from one tree to another. This is an example of a biotic interaction in which both the bee and the tree benefit – the former is rewarded with a nectar meal and the trees end up producing seeds.

At maturity, the round, woody fruits, the size of cannon balls, fall to the ground with ten to 25 edible seeds about 1.5 inches (3.8 cm) long trapped inside. In botanical terminology, a nut is a kind of fruit so this is why the Brazil nut would have been more appropriately named the "Brazil seed".

The fruit walls are chewed open and the seeds are removed and carried away by agoutis (rodents about the size of a cat), and less frequently by squirrels. Because the seeds are trapped inside the thick, woody fruits and because the bony seed coats are difficult to open, only animals with sharp teeth or a strong bite are able to consume the seeds. The agoutis and squirrels eat some of the seeds and cache others for future consumption. Some of the cached seeds are forgotten by the animals, and it is these seeds that may germinate and grow into the next generation of trees. Once again, the animals and the trees benefit: the former get a meal and the latter have their seeds dispersed to an area where they have a better chance of growing into adult trees.

The Brazil nut is an NTFP that provides income for the Amazonians who harvest it for food. The harvesting of Brazil nuts has long been cited as a prime example of how human economic activity can provide income for people and protect the biodiversity of tropical forests at the same time. However, a study by Carlos Peres and colleagues have demonstrated that continuous harvesting of Brazil nuts over long periods results in Brazil nut groves without juvenile trees; thus, there will be no replacement by younger trees when the older trees senesce and die. We continue to learn that tropical rain forests are so complex that every time they are exploited by humans they suffer negative impacts on their ecology and diversity. (*Source*: Plant-Talk, 13 August 2009.)

Amazon nuts at exploitive prices

La Paz. The Plurinational State of Bolivia is the world's leading exporter of the shelled Brazil nut (*Bertholletia excelsa*), a nutritious food source that grows abundantly in the country's Amazon rain forest region. But in

this tropical paradise, many of the nut gatherers live in hellish conditions. Bolivians simply call the *Bertholletia excelsa* a *castaña* (a catch-all name for "nut"). Globally, it is known as the Brazil or *pará* nut, while in South America it has many other local and traditional names.

The Brazil nut is a food rich in selenium and other minerals, as well as proteins, carbohydrates and oils, and represents 30 percent of the Amazon forest revenues in the northern Bolivian provinces of Pando and Beni, bordering Brazil. In fact, nut gathering is the main local economic activity, following the decline of natural latex extraction from the jungle's rubber trees in the mid-1980s.

But the competitive price of Brazil nuts from Bolivia brings with it a heavy component of exploitation of poor families, including children and adolescents, warns a study by the Centre for Labour and Agrarian Development Studies (CEDLA), sponsored by the Ministry of Labour, the United Nations Children's Fund (UNICEF) and the Netherlands organization Hivos (Humanist Institute for Development Cooperation).

Families who work gathering nuts are in a situation of extreme vulnerability, according to the study. Poverty, exclusion from labour rights and "cruel" exploitation are the norm in the collection of nuts in the northern Bolivian Amazon, according to CEDLA researcher Bruno Rojas.

In the 2008 season, which lasted from November to March, nut gathering mobilized some 17 000 people in Pando, Rojas told Tierramérica. Nut exports in that period represented 75 percent of the region's economic movement. Data from Bolivia's foreign trade institute indicate that exports reached US$80 million and created jobs for 30 000 people, including work in nut processing and transport.

Under the "piecework" mode, workers are paid US$11–17 per 23-kg box of nuts, which takes 12 to 14 hours to gather. Not only is the work poorly paid, but workers, and often the entire family, put in much more than eight hours a day, the limit stipulated by the country's labour laws.

In last year's harvest, the nut company owners and landholders caused an artificial drop in the price of the 23-kg box, from US$17 to just US$3, according to María Saravia, communications secretary of the Confederation of Indigenous Peoples of Bolivia. This practice is common among landowners and wholesalers, in order to drive down wages and then avoid paying back wages for the harvest, she said in a Tierramérica interview.

Some indigenous communities that have obtained formal title to their land can get better prices and deliver their products to whoever they choose, but workers and their dependants who come from other regions are subject to the whims of the wholesalers, Saravia added.

"This is an ongoing fight for a change in the lives of the nut-gathering families," said the indigenous activist. According to Rojas, "the more that is produced, the more the country's labour laws are broken".

According to the Ministry of Labour, in 2007 there were 2 600 children and 2 000 adolescents involved in nut gathering, and 450 children and 1 400 adolescents working in nut processing. In the cracking, shelling and selection of Brazil nuts, two out of three children in the area work five days a week between 2 and 7 a.m, "and the lucky ones go to school at 8 a.m., without sleeping or eating, and they fall asleep in class," said the UNICEF representative in Bolivia. (*Source*: Tierramérica, 5 October 2009.)

BUSHMEAT

New analysis sounds alarm over the scale of the bushmeat trade in Central Africa

New analytical techniques have revealed that the scale of the bushmeat trade in Central Africa may be much larger than originally thought, according to a study published on 16 October 2009 by TRAFFIC, the wildlife trade monitoring network.

The study, based on an analysis of food balance sheets provided by FAO's statistical database FAOSTAT, strongly supports the view that the current situation of bushmeat hunting in Central African rain forests is precarious. According to the analysis, bushmeat extraction rose considerably in the Congo Basin between 1990 and 2005, despite the overall decrease in forest cover in Central Africa.

Cameroon appears to be exceeding – by more than 100 percent – an estimated sustainable offtake of 150 kg of game meat per square kilometre of forest, and Gabon and the Republic of the Congo are both close to this limit. The greatest rise in bushmeat production was in the Democratic Republic of the Congo, where the yield rose from 78 000 tonnes in 1990 to 90 000 tonnes in 2005. In the Republic of the Congo, production almost doubled, from 11 000 to 20 000 tonnes per year in the same time period.

"While the FAOSTAT bushmeat data probably underestimate and should be regarded with caution, the data are the most readily available official sources of information on production of wild meat in the Congo Basin and are valuable indicators of bushmeat production and consumption trends," says Stefan Ziegler, Programme Officer with WWF Germany, and author of the report.

Wildlife is a significant and direct source of protein for more than 34 million people living in the Congo Basin and bushmeat hunting is a key component of many people's livelihoods in Central Africa.

Earlier studies have demonstrated that bushmeat extraction increases with human population growth. However, the latest study finds that bushmeat consumption also increases significantly with personal wealth. "Bushmeat consumption is higher in countries with large urban populations, and the increasing urbanization in the Congo region is likely to place even greater pressure on wild animal populations there," says Ziegler, adding that the "danger is unsustainable offtake of wild game that will lead to a collapse in wild animal populations and widespread human hunger in the region".

Unsustainable harvest levels are widely believed to be the most immediate threat to the region's forest mammals. "Local people have hunted for centuries, for food and for barter, but the last 20 years have seen the emergence of a commercial bushmeat market due to rural people being increasingly drawn into the cash economy," says Nathalie van Vliet, TRAFFIC Bushmeat Strategic Advisor. "The impacts of subsistence hunting were previously balanced by the fact that the hunting was done on a rotation basis on alternate tracts of forest areas. However, shifts in human population dynamics and socio-economic factors are leading to rising and increasingly unsustainable demands on wild animal populations."

An earlier WCS (Wildlife Conservation Society) study found that offtake by commercial hunters in southeastern Cameroon was ten times more per immigrant hunter than for local subsistence hunters.

"What is clear is that management strategies to prevent overharvesting need to be implemented and measures put in place to provide alternative sources of protein for the inhabitants of the region."

However, the study also indicated that the development of animal husbandry may not be an ideal solution to provide substitute protein for game meat. The study, *Application of food balance sheets to assess the scale of the bushmeat trade in Central Africa*, was launched at the Convention on Biological Diversity's Liaison Group on Bushmeat meeting, which took place in October 2009 in Buenos Aires, Argentina.

Further to the results of the study, TRAFFIC is encouraging countries in Central Africa to enhance enforcement efforts and establish concrete law enforcement mechanisms targeted at curbing commercial bushmeat poaching. "Central African countries can cooperate in addressing this growing problem through the development of a regional enforcement plan and creating the political will to combat commercial bushmeat poaching in regional fora such as the upcoming Yaoundé +10 Summit," says Germain Ngandjui, TRAFFIC's representative in Central Africa. (*Contributed by*: Roland Melisch, Global Programme Coordinator, TRAFFIC International, c/o WWF Germany, Rebstoecker Str. 55, D 60326 Frankfurt, Germany. Fax: +49 69 617221; e-mail: melisch@wwf.de; www.traffic.org)

Gorilla virus in our midst

Researchers are shaking up the HIV family tree again. For the first time, investigators have found what looks like a gorilla version of the AIDS virus in a person. They do not know how the Cameroonian woman described below became infected but suspect that other humans harbour a similar virus. The possibility that gorillas can transmit the virus to humans further underscores the danger of butchering the apes or keeping them as pets, which still occurs in some African communities.

Several studies have shown that the most common form of the human immunodeficiency virus, dubbed HIV-1, probably evolved from a chimpanzee relative, SIVcpz. When investigators reported three years ago that they had found a similar SIV, SIVgor, in gorillas living in Cameroon, a genetic analysis suggested that it too descended from SIVcpz. Now the finding of SIVgor in a Cameroonian woman who moved to France five years ago further complicates the story.

In a paper published online this week in *Nature Medicine*, virologist Jean-Christophe Plantier of the Université de Rouen in France and his colleagues describe how a 62-year-old woman suffering from fever and weight loss sought medical care shortly after arriving in Paris. The woman tested positive for HIV antibodies and had suffered some damage to her immune cells but had not developed AIDS. Plantier's laboratory, however, could not make copies of her virus, a standard diagnostic step in wealthier countries that quantifies how much HIV a person has in the blood. He and his collaborators eventually succeeded by using novel reagents designed to sequence unusual HIV strains. The virus they found was most closely related to SIVgor. "I was very surprised to find SIVgor in the human population," says the paper's senior author, François Simon, a virologist at Hôpital Saint-Louis in Paris. (*Source*: ENN Daily Newsletter, 6 August 2009.)

Bushmeat may cause the extinction of the saola (*Pseudoryx nghetinhensis*)

Conservation biologists based in four countries gathered for an emergency meeting in Vientiane, Lao People's Democratic Republic, from 19 to 21 August 2009, to address the peril of extinction facing one of the world's most enigmatic mammals, the saola (*Pseudoryx nghetinhensis*).

The saola inhabits remote valleys of the Annamite Mountains along the border of the Lao People's Democratic Republic and Viet Nam and was discovered only in 1992. At the time of its discovery, it was already rare and restricted to a small range. The experts attending the meeting agree that saola numbers appear to have declined sharply since then, dangerously approaching the point of extinction.

The saola resembles the desert antelopes of Arabia, but is more closely related to wild cattle. Its prominent white facial markings and long tapering horns lend it a singular beauty, and its reclusive habits in the wet forests of the Annamites give it an air of mystery. The saola has rarely been seen or photographed, and has proved difficult to keep alive in captivity. There are none of these animals in any zoo, anywhere in the world. The wild population may number only dozens, certainly not more than a few hundred.

The saola is threatened primarily by hunting. The Vientiane meeting identified snaring and hunting with dogs (to which the saola is especially vulnerable) as the main direct threats to the species. The IUCN Red List of Threatened Species lists the saola as critically endangered, which means it faces "an extremely high risk of extinction in the wild". With none in zoos, and almost nothing known about how to maintain them in captivity, saola extinction in the wild would mean its extinction everywhere, with no possibility of recovery and reintroduction.

The participating agencies and organizations taking part in the meeting committed to take specific actions in the next 12 months to improve significantly the conservation of the species. Above all, the group emphasized that the saola cannot be saved without intensified removal of poachers' snares and the reduction of hunting with dogs in key areas of the Annamite forests.

According to William Robichaud, Coordinator of the Saola Working Group and chair of the meeting: "We are at a point in history at which we still have a small but rapidly closing window of opportunity to conserve this extraordinary animal". (*Source*: Critical Ecosystem Partnership Fund.net, 4 September 2009.)

ECOTOURISM

Culinary ecotourists in Costa Rica turn wilderness foraging into dinner

Strolling through an equatorial rain forest or a northern pine forest can be thrilling enough, if only for the lavish scenery. But when you learn that you can eat a lot of what you see, a picturesque landscape takes on added intrigue. That's the fun behind a burgeoning form of responsible leisure travel called culinary ecotourism – a new breed of gastronomic vacation. The goal is to experience food not just as a diner, but as a gatherer and member of the kitchen staff.

In the sultry air beneath the Corcovado rain forest canopy in Costa Rica, tourists wander past possum wood and *ceiba* trees, hanging cacao pods and an occasional overhead arch of banana leaves the size of queen-size beds. This trek is a favourite

outing called the Edible Landscape Tour, conducted by Playa Nicuesa Rainforest Lodge in Piedras Blancas National Park, a remote, pristine corner of Central America.

As tourists enter the jungle they are guided to examples of wild rain forest produce. First is the ungainly *espavel*, a cashew tree, which produces a sweet, edible apple, the *jocote de marañon*, to which the actual cashew nut is attached. Up the trail there is *cas*, "sour guava", harvested for juices and jams, and *mimbro*, a kind of dwarf cucumber that is chopped and used in a traditional Costa Rican relish.

Some of the jungle's native foodstuffs must be left unharvested. The *palmito*, for example, is destroyed by the process of extracting its fruit, hearts of palm. Fortunately for salad lovers, there is a substitute: the domesticated *pejibay*, a tree that produces the same delicacy inside renewable stems that can be removed without damaging the entire plant.

Edible insects such as termites are also offered to tourists, an exceptional example of a protein source. (*Source: Scientific American*, 9 October 2009.)

Ecuadorian jungle lodge reveals its indigenous spa

La Selva Jungle Lodge, located in the heart of the pristine Amazon rain forest of Ecuador, has created what they call "The Indigenous Spa". Two native Quichua Indian women, who reside deep in the forest but near the remote lodge, walk for an hour through the jungle from their huts to give their spiritual version of the spa experience at the lodge. For US$69 the participant is treated to a magical dusting away of evil spirits with special leaves brought fresh for each guest; next, a footbath and foot massage with special scented plants, also from the forest, set the mood. Trays of local fruit products are also prepared from the lodge kitchen and a fruit-based energy drink contains *noni* (*Morinda citrifolia*) and *açaí* (*Euterpe oleracea*).

La Selva Jungle Lodge began this project as yet another way to find sustainable work for its rain forest-dwelling neighbours. Since women are in short supply for work outside the home, the labour pool was small. Three groups of two have now been established and the women work in tandem for the US$69. The Lodge hopes to develop more spa options for their female neighbours to develop and is considering a line of rain forest products such as those used in the spa.

La Selva shares the wealth as broadly as it can with most profits from the spa returning to the community as donations through their foundation, "Helping Hands in the Forest".

La Selva has accommodated more than 50 000 guests from almost 40 countries and was a pioneer in ecotourism, winning many ecotourism awards. (*Source*: eMediaWire, 1 September 2009.)

***Rafflesia*: new hope for world's largest flower**

Deep in the jungles of Southeast Asia blooms the world's largest flower – a massive fleshy orb designed by nature to attract insects by mimicking the colour and stench of rotting meat. The bizarre bloom, named *Rafflesia* after famed British colonialist Sir Stamford Raffles who stumbled across one in Borneo in 1818, is under threat from deforestation and harvesting for traditional medicine. But under an innovative Malaysian scheme, indigenous tribes that once gathered *Rafflesia* buds by the sackload are being trained as custodians of the rare flowers, and to act as guides for ecotourists.

"We used to pick the buds and sell them to traders. We took many, many sackfuls," said Long Kadak, a member of the Semai tribe in Ulu Geroh, a scenic village in the northern Perak state which has embraced the scheme. "But now we're not selling them because we want tourists to come and see our flowers. We make much more money that way," said Long.

Long is one of a dozen guides who take visitors to the elusive blooms, as well as to enchanting butterfly groves and waterfalls. As she guides a number of tourists behind her, she said the scheme had revived traditional skills and knowledge. "Only older people used to pick them because they knew the places where they grew. Now the young people know how to reach them," she said. "Now we know the value of the flowers we don't allow our people to gather them. We've got to take care of this place," said Long, whose tribe is one of Malaysia's indigenous people known collectively as Orang Asli.

Abdul Latiff Mohamad, a world expert on *Rafflesia* from the National University of Malaysia, said the scheme has brightened the prospects of the plant, which grows only on a specific jungle vine in parts of Indonesia, Malaysia, the Philippines and Thailand.

The total number of species is debated, but many scientists agree on 24, of which three are already extinct.

Sometimes called the "corpse flower" for its stomach-churning scent, or the "giant panda of the plant world" for its rarity, the *Rafflesia* is a parasite with no stems or leaves. It first emerges as a small lump on the vine and, over about nine months, swells into a cabbage-like bud that opens to reveal a massive five-petalled flower sometimes measuring more than 1 m across. The bloom, coloured a mottled red, pink or orange depending on the species, is visible for just a few days, before turning black and rotting away. Not all varieties of *Rafflesia* have the distinctive stench, and even among those that do, the open bud has to be caught just at the right time. Abdul Latiff confesses he has rarely caught the full whiff. The smell comes from the exuding smell to attract carrion flies. They come browsing and help in pollination.

The conservation scheme originated in Sabah state in Borneo in 1993, when an enterprising national parks official asked indigenous people to monitor the buds so he could alert hotels, which sent guests to see an open bloom.

Abdul Latiff said that as well as providing income for local people, the new ecotourism business influenced developers who previously had quietly hacked out *Rafflesia* groves to avoid any interference from environmentalists. "The *Rafflesia* population of Sabah really was saved. There was no overcollection any more and people took the initiative to locate new populations they had heard about from their grandfathers," he said.

There are several more sites across the country that are potential locations for *Rafflesia* conservation programmes, he said, including some areas where "sacks and sacks" of buds are still being harvested.

New interest in *Rafflesia* has seen more studies carried out into its range and even its DNA. But Abdul Latiff says its best hope is with the Orang Asli. "They have had an association with the jungle much longer than us. If they fail in looking after the *Rafflesia*, what chance do I have?" he said. "Without this programme, they would have faced a slow death." (*Source: The Brunei Times*, 10 November 2009.)

FOREST COSMETICS

Shea nut and other beauty products get fairtrade makeover

Five companies recently released the first line of fairtrade-certified beauty products in the United Kingdom. Consumers can now buy lip balm, lotion, shower gel and face masks produced in a way that benefits small farmers and the environment. Each product contains at least one fairtrade certified ingredient.

"It's great news that now the beauty industry will get a fairtrade makeover and the farmers who grow the natural ingredients will get a fairer deal," said Harriet Lamb, Executive Director of the Fairtrade Foundation.

The Fairtrade label guarantees that the producer of the product on sale was paid a living wage for his or her work, that the product was made in an environmentally sustainable manner, and that it was not made using child labour or other forms of exploitation. "Most important, Fairtrade enables us to help ourselves and to support each other," said Nana Yago, a fairtrade shea nut producer from Burkina Faso, one of the poorest countries in the world.

Many disadvantaged producers of beauty product components such as cocoa butter, shea nut butter and Brazil nut oil will be able to increase their markets and invest greater resources in the well-being of their families and communities. Meanwhile, consumers will have a greater ability to vote with their wallets for goods produced in a socially and environmentally just manner. (*Source*: OneWorld.net, 6 July 2009.)

From honey to fragrant soap

Once flooded with a honey oversupply, local beekeepers in Thailand's northern province of Phitsanulok have come up with an innovative way to turn the amber nectar into new value-added consumer products to generate extra income.

Here in this picturesque, flower-filled countryside, the quantity of honey that can be collected amounts to as much as 4.5 tonnes every year. But as sales volumes have dropped and raising prices was not a way out, the apiarists or honey farmers of Baan Naam Ab Community Enterprise Group in the provincial seat have added value to their commodity, moving from selling only bottled honey to other goods that require more processing.

Thanks to the knowledge provided by Phitsanulok's Naresuan University, local beekeepers have been trained to make honey soap for additional income, without wasting the sometimes overabundance of pure honey from the more than 200 local beehives, painstakingly collected from the nectar of *longan* flowers, a product considered as top quality worldwide.

The apiarists have succeeded in developing natural honey soap bars with a special formula using pure honey as 30 percent of the total soap substance. To make a different product, they add bee pollen and powdered turmeric so the soap becomes a skin moisturiser as well. Liquid honey soap, using a formula of 40 percent honey, was also created with a delicate texture and a pure honey aroma. This product alone triples the value of the sweet liquid, a value-added plus.

"Pure honey can be sold to a wholesale company at around 70 baht/kg. So that means you'll be getting 70 000 baht from one tonne of honey. But if you bottle it and process it yourself, then your value-added goods, made out of one tonne of honey, will be worth around 200 000 baht. A bottle of honey can produce up to around 200 honey soap bars. A solid soap bar is sold at 25 baht to wholesalers and 35 baht to retailers," said Dao Ganget, chairperson of the Beekeepers at Baan Naam Ab Community Enterprise Group.

The honey farmers here are determined to keep developing their commodities. They believe there are still a lot of marketing channels out there for their goods as bee products, i.e. honey, royal jelly and bee pollen, have long been well known and accepted for their medicinal, nutritional and moisturizing properties.

Local residents are currently experimenting with bee pollen soap, as its main property is to help cure asthma. Despite the fact that people may consume less pure honey, when it comes to processed honey, at least those loving to pamper themselves will find these honey products simply irresistible. (*Source*: Thai News Agency MCOT, 26 August 2009.)

Neem: a centuries-old remedy for problem skin and hair

A tree native to Southeast Asia, neem (*Azadirachta indica*) is known as "the village pharmacy" in tropical regions where it is grown. It is a cornerstone of Ayurveda, one of the world's oldest medical systems, and has been used as a medicinal herb for nearly 5 000 years. Neem oil, leaf and bark are used externally for skin, scalp and hair; only the leaf and bark are used as an internal supplement.

With more than 180 separate compounds, neem has multiple properties that help rejuvenate hair and scalp while protecting them from ongoing damage. With extraordinarily high levels of antioxidants – up to hundreds of times more concentrated than those found in blueberries or broccoli – neem helps protect the skin from environmental damage.

Neem oil is rich in essential fatty acids, like those found in sea buckthorn oil, which nourish and balance problem skin. The natural oils and glycerides quickly and easily penetrate the outer layers of skin to soothe even chronically dry, itchy or flaking areas with psoriasis or eczema. It has been traditionally used to even out skin tone irregularities, helping to balance and restore proper skin pigmentation for issues such as vitiligo or age spots.

Neem is an ideal herb for acne-prone skin because it can help to soothe irritation and inflammation, clear up pimples and remove undesired levels of bacteria on the skin that can cause more break-outs.

Neem leaf, bark and oil are also packed with anti-inflammatory, antifungal, antibacterial and antiviral properties. Neem leaf is rich in naturally occurring quercetin, which is well known as a compound that supports the body's ability to respond to inflammation. Neem leaf and bark are also well documented for their immune-boosting compounds that protect against noncystic acne without drying skin – a particularly important consideration for older women.

While neem is often used for problematic skin and scalp, it also has potent anti-ageing properties that help revitalize skin, restore a youthful glow to dry or rough skin, reduce fine lines and balance skin tone. Neem cream and lotion are also great for sunburn, after-snow treatments and for general skin and facial care.

Certified organic and ethically wild-crafted neem oil and neem leaf extracts are commonly likened to tea tree essential oil for their broad-spectrum actions. However, neem oil is cold-pressed and not distilled, so it is not as drying or irritating as tea tree oil can be. All forms of neem are soothing and nourishing to the skin and scalp. Neem leaf has a mild aroma and can be taken internally as a dietary supplement or applied topically. Neem bark has even more antioxidants than the leaf and oil. (*Source*: Health News Digest, 6 July 2009.)

Use of NTFPs in hair care in Bangladesh: an overview

The use of NTFPs in health care is as old as human existence and their role in, and contribution to, the welfare of people all over the world are crucial.

In Bangladesh, the use of plants in beauty care has been practised since times immemorial, particularly among the aboriginal communities. This use has gathered momentum over the past few decades and is now a mainstream trend.

A recent study, which included an extensive literature survey, investigated the use of NTFPs in hair care in Bangladesh, the results of which are summarized in the table.

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Use of NTFPs in hair care

NTFPs	Parts used	Method of use
Amloki (*Amblica officinalis*)	Fruit	The fruit is soaked in water and then boiled and sieved; the resulting water is used as a shampoo
Bichuti (*Tragia involucrata*)	Fruit	The fruits are ground with water to make a paste, which is then applied to the head
Black pepper (*Piper nigrum*)	Fruit	Onion juice is used first, before applying a ground mixture of black pepper and salt (NaCl) to the head
Bohera (*Terminalia belerica*)	Kernel	The ground kernel is mixed with water and the mixture is then applied to the head
Chalta (*Dillenia indica*)	Fruit	Two spoonfuls of juice of the ripe fruit are mixed with water and eaten. In the case of green fruit, it is ground and the juice used as oil on the head
Dhonia (*Coriandrum sativum*)	Leaf	The leaves are boiled and the water is then used for washing hair for four to five days
Durba (*Cynodon dactylon*)	Leaf	Durba is boiled with coconut/mustard oil and is used as oil on the head
Dutra (*Datura metal*)	Leaf	The leaves are ground well to make juice and the juice is then used on the head
Joba (*Hibiscus rosa-sinensis*)	Flower	The latex obtained from the ground flowers is applied to the head as anti-dandruff
Keshraj (*Eclipta prostata*)	Leaf	The juice of the leaves is mixed with coconut oil and then used on the head
Kesut pata (*Eclipta prostata*)	Leaf	The leaves are ground, mixed with *Wedelia calendulacea* juice and then applied around the head
Kolke (*Thevetia peruviana*)	Seedling	After grinding, a paste is made and applied to the head
Mehedi (*Lawsonia inermis*)	Leaf	Leaves are ground well and boiled with *Terminalia chebula* and the mixture used twice a week around the head
Thankuni (*Centella asiatica*)	Leaf	The juice obtained by grinding five to six leaves is consumed with a cup of milk and some sugar
Til (*Sesamu indicum*)	Flower	The flower is ground well with butter oil and honey and then coated around the head
Vringoraj (*Wedelia calendulacea*)	Leaf	Leaves are ground well to extract juice, which is then applied for two to four days against head lice
Vula (*Hibiscus tiliaceus*)	Leaf	The juice obtained from grinding the leaves is mixed with honey and applied over the head

HANDICRAFTS

Fibre-yielding plants and their uses in India

For millennia, fibre-yielding plants have been an integral part of human societies, ranking second only to food plants in their use. Today, over 2 000 species of such plants have been identified. These plants are used commercially to produce cotton, jute and linen. On a smaller scale, they are used in preparing brushes, mats, baskets, fishing nets, straw hats, chair seats, bags and other articles for daily use.

In the Terai region of the Pilibhit district, Uttar Pradesh, at the foothills of the Shivaliks in the Himalayas, a wide variety of fibre-yielding plants have long been used by rural peoples in traditional cottage industries. Still today, local ethnic groups use fibre or raw material derived from local plants to produce baskets, mats, ropes, bags, threads and other items for sale and personal use.

A recent study identified as many as 20 plants of 12 angiospermic families in common use by rural peoples in Pilibhit, a district dense with forest cover (nearly 22 percent). Among these are *Bambusa*, used to prepare baskets, mats and fans; *Cannabis sativa*, used in making ropes; and *Linum usitatissimum*, used in preparing linen. (*Source*: "A survey of plants used in baskets, mats and cordage industry by different ethnic groups of Terai Region of Pilibhit District of Uttar Pradesh" in *MFP News*, XIX(3), 2009.)

Traditional willow weaving in the United States of America

For Mary Claw of the Chemehuevi tribe, basket weaving is not just an art form but is also preservation. "There's nobody left," Claw said, while weaving strips of willow into an intricate basket, adding that she learned the craft from her grandmother. "It's either me, or let [basket weaving] die. There's nobody else left in my family who does it."

The California Indian Basketweavers Association was formed in 1992, in part because more and more people were finding themselves in Claw's shoes, realizing they were the last people with knowledge that had been passed down for generations.

The association was formed to preserve, promote and perpetuate the basket weaving traditions of California's Indian tribes. And the association's annual

Basketweavers Gathering serves to do just that, as it showcases a host of delicately woven baskets and offers a plethora of workshops and training in the cultural art form. The event draws basket weavers from all over the state, who come to teach their craft, learn from each other and display and sell their works.

In addition to trying to promote and preserve the art form of basket weaving, the association also serves an advocacy role. It works with public agencies, museums and art and environmental organizations to promote traditional fire management, protect native plant habitats, decrease pesticide use in areas used to gather materials and increase access to both public and private lands.

The association's Basketweaver Support Program sponsors weaving classes in tribal communities to ensure that the traditions of basket weaving are not lost, and instead are passed through the generations. The painstaking process of making a basket – from gathering the materials to weaving them together – also teaches a kind of work ethic that is lost in many other aspects of society. (*Source*: Times-Standard, 28 June 2009.)

A challenge for craft villages in Viet Nam

For years, Viet Nam's culture and economy have been associated with craft villages and their products, which are consumed both locally and in 136 countries worldwide.

Nevertheless, few people know that the craft villages are in trouble because of raw material shortages, says Luu Duy Dan, general secretary of the Vietnam Craft Village Association.

Bat Trang pottery, Phu Vinh bamboo products and Dong Ky woodwork products have become the main trading items in the country's north because of their unique and traditional cultural features. Despite being popular villages, trade turnover is down as a result of the material supply problem.

It is believed that Viet Nam's craft villages will fall into a material supply crisis in the next ten years if local authorities fail to find solutions soon. Most of the villages lack standard materials to maintain production.

The country's bamboo area has dwindled and many enterprises import the tropical grass with its woody stems from China, the Lao People's Democratic Republic and Cambodia. "Bamboo imported from Laos's Hua Phan province is much cheaper than in Viet Nam," says a representative of Phu Vinh village.

Rattan supplies are also low after the tropical palm trees have been exploited for export. Rattan in traditional supply regions such as Vinh Phuc, Phu Tho, Thai Nguyen, Yen Bai, Thanh Hoa and Nghe An is nearly exhausted.

Viet Nam's silk products use over 90 percent substandard silk materials, resulting in poor-quality items from Van Phuc, Nha Xa and Duy Xuyen craft villages. Meo village in Thai Binh province, the country's chief exporter of fine handmade embroidered handkerchiefs, has to import fibres from India and Bangladesh at prices that are increasing year by year.

In Viet Nam, only Du Du, Vo Lang and Dong Giao wood-carving villages take materials from human-grown forests. This is a big advantage for the villages as more and more international consumers require certificates of origin from the Forest Stewardship Council.

Most craft villages in Hanoi cannot keep their production active as nearly 80 percent of the material comes from outside sources, according to the Hanoi Department of Industry and Trade. They have to import steel, iron, silk and wool from China and wood from the Lao People's Democratic Republic. Rattan and bamboo come from Son La and Lai Chau provinces.

Some villages can produce with local materials but have to depend on certain seasonal harvests. Meanwhile, the long-term development of material supply zones is the solution for the sustainable development of craft villages.

Some localities have established trade village development plans until 2020 but have yet to define material supply zones. Since these plans are being carried out in scattered provinces, they are not developing the area as a whole and the Government has yet to issue guidelines. As a result, international organizations find it hard to support development of the material supply zones. (*Source*: VietNamNet Bridge, 24 June 2009.)

LAC

Sustainable utilization of lac resource for tribal development in India

Lac is a resinous secretion of a tiny insect named *Laccifer lacca*. The lac insect feeds on the sap of host plants and secretes a resinous cover for self protection. This

BAIF INITIATIVE FOR SYSTEMATIC LAC PRODUCTION

BAIF (formerly known as the Bharatiya Agro Industries Foundation) is currently implementing integrated development projects in tribal areas across India and has established a Resource Centre for Tribal Development (RCTD) to ensure strong technical support to the field programme.

The forest-fringed project areas are rich in diversity of tree species, including those that are natural hosts of the lac insect.

BAIF has identified the systematic rearing of lac as a major intervention for livelihood generation.

BAIF's strategy is to:

- identify sites of natural occurrence, as well as traditional harvesters of lac in project areas, and develop a system for its sustainable harvesting and management;
- introduce tribal farmers participating in BAIF programmes to lac rearing by organizing training, exposure visits and demonstrations;
- promote planting of host trees of lac on farmland by introducing tree-based farming;
- work towards shifting the current dependence of lac harvesting from natural trees to deliberately grown host trees on own lands to avoid conflicts over tenure; and
- facilitate comprehensive technical support to the new generation of lac farmers.

Schleichera oliosa

resin is scraped and collected as the lac of commerce. The plants on which the lac insects occur naturally are known as host plants.

Lac is a product of good commercial value and is harvested mostly from naturally occurring trees. It is an important source of livelihood for tribal people in remote forest areas. The present system of harvesting lac from natural host trees is primitive and is not dependable. A simple technology for rearing the lac insect artificially has been developed by the Indian Institute of Natural Resins and Gums, Ranchi.

Lac has wide-ranging industrial applications in products such as wood finishing polishes, printing inks, electrical insulation, leather and footwear, pharmaceuticals, cosmetics, paper varnishes, photographic material, rubber, paint and cars.

There are many benefits associated with lac production:

- lac is a natural product that is non-toxic and fully biodegradable;
- host trees of lac insects grow mostly on non-cultivated and degraded lands, so they do not compete with crops for land;
- as lac harvesting is traditionally done by tribal people, introducing improved methods of lac insect rearing is a promising livelihood activity for them;
- processing of scraped lac also yields by-products, e.g. wax and a natural colour; and
- after scraping the lac, the residual sticks are used as fuelwood and the leaf biomass for composting.

Some of the lac host plants of importance under central Indian conditions are flame of the forest tree/*palas* (*Butea monosperma*), the *kusum* tree (*Schleichera oliosa*) and ber (*Zizyphus mauritiana*). (*Source*: MITTRA-BAIF, RCTD Fact sheet 2.)

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MEDICINAL PLANTS

Medicinal plants in conservation and development

Traditional medicine, based largely on herbs, still supports the primary health care of more people worldwide than "conventional" or Western medicine. According to the World Health Organization, up to 80 percent of the population in Africa use traditional medicine for their primary health care, and natural remedies are also popular in many Western countries. The majority of plant species used in traditional or herbal medical treatments are harvested from the wild rather than cultivated. In some parts of the world, large numbers of people are involved in the collection of wild medicinal plants to sell – for example, people from an estimated 323 000 households in Nepal alone.

About 15 000 species of medicinal plants are globally threatened – the causes include loss of habitat, commercial overharvesting, invasive species and pollution. The extinction or scarcity of these plants is not only a problem for conservation – it also results in serious problems for people's health and livelihoods.

Plantlife's Plant Conservation and Livelihoods Programme was established to find ways to conserve these medicinal plants and ensure their availability for continuing use. Under the programme, Plantlife has supported local partners in China, India, Kenya, Nepal, Pakistan and Uganda to mount community-based projects on the conservation of medicinal plants. A further four projects have been organized for the exchange and evaluation of experiences. Plantlife's report, *Medicinal plants in conservation and development: case studies and lessons learnt* presents a description of these projects and an analysis of lessons learned. A set of principles, actions and conditions needed to promote the success of community-based conservation of medicinal plants is provided, based on these experiences.

Because of the value of these resources for local health care or income, we believe that a focus on medicinal plants in conservation or development carries the potential to save many other types of plants and animals as well – the inhabitants of those habitats that are valued for their medicinal plants. Thus, the presence and sustainable use of medicinal plants can be the key to conserving whole habitats.

There are three main elements in our recommended approach.

- **Community groups:** members of local communities with a special interest in medicinal plants who are prepared to work within their communities to foster developmental activities related to the conservation and use of these plants. At this level, conservation means having ensured supplies of medicinal plants to provide continuing benefits for the

WHAT IS A MEDICINAL PLANT?

A medicinal plant is one used by people for medicinal purposes – to build or maintain health, stave off disease, or promote recovery from illness or misfortune. No precise definition is possible, given this wide scope and because the use of plants as medicines grades into their use for other purposes, for example, for food, personal hygiene, beauty care, psychological support and spiritual practices.

Traditions of health care must have always been features of human societies and from the evidence available it seems that plants have normally been accorded lead roles in therapy. Even today, traditional medicine (based largely on herbs) supports the primary health care of more people globally than "conventional" or Western medicine.

community in terms of health care, income or retaining cultural traditions.

• **Project teams:** composed of individuals willing to make an effort to help communities conserve their medicinal plants or create a favourable enabling environment. Project teams may consist of individuals from various types of organizations. In our case studies, they are from NGOs and research institutes, but task teams in government departments and civil society could also take this role, for example in forestry departments, faith-based groups, women's associations, indigenous people's organizations or the organic movement.

• **The enabling environment:** embracing all those forces that influence affairs at the community level, such as laws and regulations; national policies towards indigenous groups; local health care traditions and the management of natural resources; the ethical stances of industry and consumers; the orientation of research institutes; and the positions of religious establishments and political parties on the environment.

We have assumed a three-tier structure of society for the purposes of our blueprint for the successful conservation of medicinal plants – the community, the district level and the state.

Our concentration is on species that carry value at the community level. Plants vary in their value according to the community – species valued for their medicinal properties in one community may not be similarly valued in another. Therefore, additional approaches are needed to safeguard plants fully that have been recognized as medicinals. Other conservation tools such as protected areas and *ex situ* conservation have important roles to play, and should be linked with the community-based approaches described in this report to ensure their relevance to development. (*Source*: A.C. Hamilton, ed. 2008. *Medicinal plants in conservation and development: case studies and lessons learnt*. Salisbury, United Kingdom, Plantlife International.)

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(*Please see page 73 for more information.*)

Artemisia annua

Traditional medicines could prevent some of the millions of malarial deaths in Africa

Each year, between one and three million malaria deaths occur, an estimated 90 percent of which take place in sub-Saharan Africa. Encouraging the use of traditional African herbal medicines could prevent some of these deaths, said specialists attending the 5th Multilateral Initiative on Malaria Conference in Nairobi on 6 November 2009. Over 2 000 health experts gathered to exchange views on malaria issues and discuss how to "bring knowledge to action".

Between 1981 and 2002, 61 percent of new chemical entities brought to market derived from, or were inspired by, sources found in nature. Citing research in India, BN Prakash, researcher with the Bangalore-based Foundation for the Revitalization of Local Health Traditions, told the Conference that a five to ten times reduction in malaria-related deaths was noted among communities that use traditional medicinal plants such as *guduchi* (*Tinospore cordifolia*). Another natural product, artemisinin, the current antimalarial therapeutic mainstay, is instead isolated from the leaves of the sweet wormwood plant (*Artemisia annua*). Traditional medical practitioners have a time-honoured understanding of the medicinal properties of many natural substances. "When we carried out research involving school children in rural Tanzania about traditional Maasai medicines, we found out that 48 percent of these children already had knowledge about these plants. We used [this knowledge] to create a database for the purposes of preserving the knowledge and these plants too," said Gemma Burford of the Global Initiative for Traditional Systems of Health. Efforts ought to be made, says Burford, to preserve this knowledge.

Exploring traditional medicine is particularly useful, given the problem of accessing malaria drugs in many remote areas of the world. Taking the traditional medicinal route exclusively, however, has its risks. Doumbo Ogobara and Mahamadou Sissoko of the Mali Malaria Research and Training Centre both called for caution, arguing many malaria-related deaths have occurred in places where traditional medicine is practised. "More research must be directed towards finding out the effectiveness of these traditional medicinal plants and their safety and efficacy because initiatives on using them could be counterproductive if this is not done. More emphasis therefore must be laid on research for plant-based prophylactics for malaria," said Ogobara. (*Source:* SciDev.Net Weekly Update, 2–8 November 2009.)

Climate change endangering medicinal herbs in India

Climate change is threatening the existence of several Indian herbs that are key ingredients of the traditional Ayurvedic system of medicine, President Pratibha Patil said today, and expressed concern over the trend.

"Ayurvedic medicines make intelligent use of herbs. Climate change is disturbing the ecological balance which is making these herbs extinct. It is a big challenge for us," she said, while inaugurating centenary celebrations of the All India Ayurvedic Congress here. She said that the herbs and plants that are becoming extinct should be properly categorized and efforts made to protect them, which would require the help of the National Medicinal Plants Boards and the Central Institute of Medicinal and Aromatic Plants.

According to Vaid Devendra Triguna, the Chairman of the Congress, herbs such as *kutki, atees, kasturi* and *praval*, which form the basis of several Ayurvedic drugs, are becoming difficult to find because of changes in climate. "We used to get good herbs from Himachal Pradesh but now it is becoming difficult. We have helped the states to constitute medicinal plant boards which are working in this area," Triguna said. (*Source*: Indopia [New Delhi], 7 October 2009.)

Periwinkle: the "antineoplastic" medicinal plant

The Indian subcontinent is endowed with a rich source of medicinal plants, one of which is periwinkle (*Catharanthus roseus*) or *vinca*. This important medicinal plant is cultivated in tropical regions. Originating in Madagascar, in India it is cultivated mainly in the Tirunelveli, Theni and Madurai districts of South India.

Periwinkle is an evergreen herbaceous shrub or plant, growing to a height of 1 m. Its leaves are oval to oblong, 2–9 cm long and 1–4 cm broad; they are glossy green with a pale midrib and a short petiole 1–2 cm long, and are arranged in opposite pairs. The flowers are white to dark pink with a darker red centre. The basal tube is 2.5–3 cm long and has a corolla with a diameter of 2–5 cm with five petal-like lobes. The fruit is a pair of follicles of 2–4 cm long and 3 mm broad.

The cultivation of this crop gained momentum because of the presence of alkaloids, i.e. vincristine and vinblastine, in their leaves. These are commonly called "antineoplastic" alkaloids and are used in the treatment of various types of cancers either to slow down or to hamper the growth of cancer cells. Vincristine is mainly used for the treatment of leukemia, Hodgkin's lymphoma, non-Hodgkin's lymphoma, neuroblastoma, Wilms' tumour and other types of cancer. Vinblastine is primarily used for the treatment of testicular cancer, breast cancer, choriocarcinoma, mycosis fungoides, Kaposi's sarcoma and Letterer-Siwe disease.

There are three local types of *Catharanthus roseus* based on the colour of the flower, i.e. alba (white), roseus (pink) and oscillate (white flowers with a purple spot in the centre). There is not much difference in the alkaloid content of these types. The Central Institute of Medicinal and Aromatic Plants in Lucknow has released three varieties, namely *nirmal*, *dhawal* and *prabal*, all possessing a high alkaloid content.

Periwinkle can be propagated through seeds and grown in all types of soils except those that are waterlogged. It can be cultivated in areas with more than 100 cm rainfall. Periwinkle is harvested one year after sowing. The plants are harvested by cutting them 10 cm from the ground. They are then dried and separated into stems, leaves and seeds. The leaves are used for the extraction of alkaloids. (*Contributed by*: M. Velmurugan, K. Rajamani, P. Hemalatha and C. Harisudan, Tamil Nadu Agricultural University, Coimbatore – 641 003, India. E-mail: hortmrvelu@yahoo.com)

Catharanthus roseus

Devil's claw (*Harpagophytum procumbens*): research work may save African plant as a natural health resource

An African plant with highly regarded medicinal properties has been threatened with extinction, but researchers around the globe are coming together to preserve its unique compounds for natural medicine.

Devil's claw (*Harpagophytum procumbens*) – which is under threat from drought in large parts of Africa – is believed to provide effective treatments for a range of conditions including arthritis and tendonitis. In fact, its extracts are in Phase II clinical trials in the United States of America for the treatment of hip and knee arthritis.

Scientists suspect that its beneficial effects stem from compounds called iridoid glycosides harpagoside and harpagide.

Dr Milen I. Georgiev says the plant currently faces significant problems with natural renewal, mainly caused by low rainfall in areas where it grows. "These problems are driving efforts to find alternative ways to produce high-value compounds from the plant, independent of geographic and climatic factors," he stresses. Georgiev is one of the scientists spearheading the effort, and at the recently held 238th National Meeting of the American Chemical Society he presented a paper describing a new technique that may be used to develop "biofactories", which could produce large quantities of the plant extracts at low cost. (*Source*: Personal Liberty Digest [United States of America], 14 October 2009.)

MUSHROOMS

Food security project offers hope of self-sufficiency

Eleven years ago Chido Govero, who never knew her father and lost her mother to AIDS, was rescued from an orphanage in Zimbabwe by a local scientist working with the ZERI (Zero Emissions Research and Initiatives) Foundation.

At the young age of 12 she began work in a university research laboratory, studying local wild mushrooms and their potential as a domesticated food source. Govero and her colleagues in the university discovered that for communities lacking a consistent supply of food, mushrooms offer superior nutrition and have the potential to contribute dramatically to food security. Govero was fascinated by the accessible and nutritious mushroom, and became an expert at making them thrive with the simple materials readily available, even to homeless orphan girls.

Now 23 years old, she is cultivating native mushrooms in mulch composed of discarded organic materials, such as fallen leaves and the husks from coffee beans, and is on a mission to teach other orphaned girls to find the mushrooms in their local environments and cultivate them for food and income. Govero has already trained a dozen other orphaned girls on how to grow mushrooms from coffee pulp. Her plan is to reach out and network throughout Africa to create jobs and alleviate hunger with what is locally available.

In July 2009, Equator Coffees, a successful American-based, woman-owned company known both for social responsibility and artisan coffees, launched Chido's Blend™ to raise funds to support Govero's work.

"Chido is an inspiration to all women entrepreneurs who work for social change," said Helen Russell, cofounder and Chief Executive Officer of Equator Coffees. Russell recently met Govero, who travelled to the United States of America to visit leaders in the speciality coffee industry. "Chido's Blend™ will raise funds critical to the success of her efforts, and inspire coffee lovers to look deeper into the power of their morning cup. This cause takes coffee to an entirely new level." One hundred percent of the profits from the sales of Chido's Blend™ will go towards Govero's work in coffee-growing communities. Her programme also receives vital support from the ZERI

Foundation, which specializes in international sustainable development. (*Source*: Sustainable Food Examiner, 5 August 2009.)

Study finds breast cancer-fighting properties of mushrooms

A recent study published in the *International Journal of Cancer* found evidence that mushrooms have breast cancer-fighting properties.

This study was conducted at the University of Western Australia in Perth and included 2 018 women. Half of the women were diagnosed with breast cancer. After adjusting for lifestyle patterns such as education, smoking, overeating and exercise levels, the researchers discovered that the women who ate at least 10 g of button mushrooms per day were 64 percent less likely to develop breast cancer. Dried mushrooms also significantly reduced the risk, but not so much as fresh mushrooms.

A substance found in mushrooms called linoleic acid may be the key to the reduced risk of breast cancer. Linoleic acid inhibits aromatase activity. Aromatase is an enzyme that helps the body to produce oestrogen. High oestrogen levels are a well-known risk for breast cancer. As many breast cancers depend on oestrogen to grow, the aromatase-inhibiting actions of mushrooms may be responsible for the reduced risk. Aromatase inhibitors are used as treatment to prevent certain types of breast cancers from recurring. Examples of these drugs are Arimidex, Femara and Aromasin.

The study also revealed that women who combined a mushroom diet with regular consumption of green tea saw even greater benefits: a reduced risk of almost 90 percent. This well-known antioxidant and anti-inflammatory agent helps prevent breast cancer by decreasing the amount of oestrogen a woman's body produces. (Like cholesterol, oestrogen has a good kind and a bad kind – and an excess of the bad can promote breast cancer.)

In addition to the theory of the benefits of linoleic acid, mushrooms have been found to strengthen the body's immune system and also possibly block tumour development. In several laboratory studies, mushroom extract has been shown actually to stop the growth of breast cancer cells. There is an ongoing study examining whether or not taking a mushroom extract twice a month can prevent the recurrence of breast cancer. Earlier studies have suggested that the traditional medicinal mushroom, *Phellinus linteus*, hampers the growth of skin, lung and prostate cancer cells. (*Source*: Natural News.com, 22 September 2009.)

Viet Nam succeeds in farming medicinal mushrooms

The HCMC Center for Reishi and Medicinal Mushrooms Research has successfully grown the *thuong hoang* mushroom, which has active elements that can help treat cancers, especially in the breast, liver and stomach.

Co Duc Trong, Chair of the project to grow the mushroom in the city, said that *Phellinus linteus* has been used in traditional medicine for a long time. This mushroom is of particular interest to researchers around the world because of its tumour-prevention properties. It only grows deep in the forest and high up in mountains and can live for tens of years.

The total global output productivity of the mushroom is around 30 tonnes a year, mainly from natural sources. Only four countries have managed to farm it: the Republic of Korea, China, Japan and Thailand. With demand high, 1 kg costs VND4–10 million (US$228–571), there are a lot of fakes.

Since 2006 the Center has successfully grown *P. linteus* in sawdust made from rubber trees instead of in tree trunks, as done by other countries. It has so far produced around 140 kg, Mr Trong said. This process protects the mushrooms from diseases and is cleaner and more uniform. It can be grown for export and for selling to drug companies, he added. (*Source*: SGGP, 12 August 2009.)

PALMS

The use of *tagua* or vegetable ivory (*Phytelephas macrocarpa*) by Amazonian communities

In the Peruvian Amazon, palm trees play an important role for native communities and in the most recent colonizations. Some species have many promising possibilities, e.g. the use of fruits and palm hearts; in the extraction of oils; for flour and fibre; for wood floors (mainly parquet); and in roofing leaves for rural dwellings.

Tagua, (*Phytelephas macrocarpa*), known locally as *yarina* is an Amazonian native species, not domesticated, with great potential for commercial cultivation in the Peruvian jungle. Natural exploitation in the past occasionally generated resources in the region and promoted rural employment, mainly to make vegetable buttons for the external market.

This species is present in Brazil, Colombia, Ecuador and Peru. In the Peruvian rain forest it is found in the wild in the departments of Loreto, San Martin, Amazonas, Huánuco and Junín.

Tagua is a dioecious palm, which belongs to the botanical family Araceae and reaching 12 m in height, and 3 m to the base of the leaves, in adult plants. The species grows in the wild in recent flood plains, known as *tahuampas*, which are periodically flooded. In unflooded land, the palm grows best in a soil that is rich in organic matter and with good drainage.

The food of the fruit of *yarina* is the mature endosperm, which is consumed without cooking and has a pleasant taste like coconut. In the construction of rural houses and urban settlements, the leaves are used to build roofs. The fruit is also exploited as vegetable ivory.

The massive and uncontrolled uses of these palms are causing the depletion of natural forests close to population centres and, consequently, residents must travel greater distances to obtain this resource. We need to know more about the basic aspects of the species, such as its biology and ecology.

A study was conducted in the three riverside communities of Buenos Aires, Arequipa and Yarina, located in the forests of the lower river Yanayacu Pucate, inside the Reserva Nacional Pacaya Samiria (RNPS), jurisdiction of the district of Nauta, province of Requena. The research was conducted with the support of the Fundación Peruana para la Conservación de la Naturaleza (Pro Naturaleza) and RNPS.

The objectives of this study were to evaluate the production potential of *yarina* and community involvement in the harvesting of its leaves and fruits. An inventory was also conducted for each community, with 20 x 20 m (400 m^2) plots,

depending on the distance sampling. In addition, a survey was carried out to determine the ethnobotanical use of *yarina* by the local population.

The floristic composition of *yarinales* (areas dominated by *yarina* palms) was assessed by the presence of tree species such as *Hura crepitans, Spondias mombin, Duguettia tessmani, Eschweilera juruensis, Mouriri* sp., *Mouriri acutiflora, Chlorophora tinctoria, Ficus paraensis, Myrciaria floribunda, Chrysophyllum peruvianum* and *Apeiba aspera*. Only the palms of *yarinales* were evaluated: *Socratea exorrhiza* and *Attalea tessmannii*.

The density population of *yarinales* evaluated in the three communities was about 575–917 palms/ha.

The greatest abundance of leaves was found in the community of Buenos Aires, with 153 907 leaves/ha, followed by that of Arequipa with 135 720 leaves/ha and finally in Yarina with 81 840 leaves/ha.

Fruit production was also recorded, with 107 fruits in the community of Buenos Aires, 92 fruits in that of Arequipa and 17 fruits in Yarina, with an average from 0.32 to 0.43 fruits/individual and a total of from 141 to 297 fruits/ha, indicating that these *yarinales* were producing more leaves than fruits.

The harvest of the fruit is commonly carried out for the purpose of nourishing the local people (the unripe fruit is preferred), with a production of from one to five fruits per family and a harvest period from one to four months. The mature fruits are not harvested since they have no economic value within the community.

The community, both men and women, participates in the harvest of the *yarina* leaves and fruits. For the production of a *cumba* (fabric leaves used for roofing houses), the average number of loads (50 leaves) used is from 18 to 21, but this number varies with amounts ranging from 1 250 to 2 275 leaves from 24 to 45.5 equivalent loads. The average time in which people return to harvest the leaves in the same *yarinal* ranged from two to five years. The harvest of leaves for commercial purposes has been negligible; however, in some cases a *carga* of leaves is sold within the same community. A *carga* is equivalent to 50 harvested leaves and has a selling price of about US$1.61.

Fruit production was affected in the three *yarinales*, because of continual pressure from the harvesting of leaves, making these *yarinales* only leaf producing. A suitable method needs to be found in the future, therefore, that enables the sustainable harvest of leaves without affecting fruit production. (*Contributed by*: Joe Sixto Saldaña Rojas, Red Ambiental Loretana (RAL), Av. Guardia Republicana (ex-Guayabamaba) Nº 163 - a 100 metros del COA. E-mail: redambientalloretana@yahoo.com *or* jsaldanar@gmail.com; www.redambientalloretana.org)

SEA BUCKTHORN (*HIPPOPHAE RHAMNOIDES*)

Sea buckthorn ties relations between India and Mongolia

India and Mongolia have joined hands to tap the potential of sea buckthorn (*Hippophae rhamnoides*), a plant better known here as *leh* berry, found in abundance in both countries.

On a three-day visit to Ladakh to see the initiatives taken by the Defence Institute of High Altitude Region (DIHAR) to make the plant economically useful for the local population, the Mongolian Ambassador to India Voroshilov Enkhbold told the Indo-Asian News Service (IANS): "We have sea buckthorn in Mongolia also, mostly in the western province. We have seen how valuable it is".

Most of the Ladakh region in Jammu and Kashmir is a cold desert, similar to the Gobi desert in Mongolia. "I want to establish some relation with India on how to tap the potential of the plant," the Ambassador said.

Enkhbold will be taking to Mongolia samples of *leh* berry juice, a herbal antioxidant supplement prepared from the plant; a herbal tea; and some of the 200-odd products prepared by DIHAR scientists. "We are sending two of our scientists to Mongolia to share our success story in making the plant a source of income for the local population," said DIHAR Director Shashi Bala Singh.

There is plenty of sea buckthorn growing wild in Ladakh, a region in India where temperatures can plunge to as low as -50°C. Distributed over 11 500 ha in the area, the shrub can withstand the extreme temperature, including huge fluctuations in temperature, since it can also get hot under the cloudless sky.

The berries have high concentrations of vitamins A, B_2 and C, far higher than in other fruits and vegetables such as oranges, carrots and tomatoes. "The plant is a boon for the region. It fixes atmospheric nitrogen into the soil, making it more fertile; checks soil erosion; and its leaves are anticancerous, preventing tumours and improving immunity. So we call it the Golden Bush of the cold desert," Singh told IANS.

In 2001, DIHAR commercialized the beverage it prepared from the fruit under the name "Leh Berry Juice". In 2004, it made a herbal tea, the formula for which will soon be transferred to two vendors. In 2005, it came up with a jam and a sauce and, in 2009, with a herbal antioxidant supplement prepared from the plant.

"Currently we are undertaking tests for an ultraviolet protective oil and a soft gel capsule rich in seed oil and omega fatty acids to be used as a food supplement," Singh added.

The locals, who once used to consider sea buckthorn a weed, have benefited from the new findings of DIHAR and are now selling the fruit here as well as in other states.

Spondias mombin

Tsering Stobdan, a senior scientist working on the sea buckthorn research projects and a native of Ladakh, said: "So far, less than 5 percent of the plant's potential in the region has been exploited. The demand for the fruit is increasing and reflected in its price, which has increased from 8 to 30 rupees/kg in recent months". (*Source*: Bombay News, 30 September 2009.)

Time for Himachal (India) to explore commercial aspects of sea buckthorn

Palampur, Himachal Pradesh. Sea buckthorn (*Hippophae rhamnoides*), locally known as *charma*, has attracted the global attention of scientists, environmentalists, industrialists and various other agencies because of the presence of vitamins and many other substances in its fruits, leaves and bark. The medicinal values of this plant were discovered by Tibetan doctors in the early eighth century. However, its industrial utilization started in the former Soviet Union, when Russian scientists discovered its rich vitamin values in 1940.

With the opening of the Soviet Union in early 1980, the Chinese discovered that sea buckthorn food products and drugs helped in improving the immunities of astronauts. Later, a Chinese scientist translated a Russian book on sea buckthorn into Chinese and, consequently, active research work on various aspects of sea buckthorn began in several universities and other institutions in China. Developing its own indigenous technology as well as transferring the Russian expertise, China has now established over 300 industries based on sea buckthorn in 19 states, producing a range of health protection food products, life-saving drugs and cosmetics.

Learning from the experiences of the former Soviet Union and China, active research and plantation of sea buckthorn orchards were initiated in more than 40 countries in Europe, Asia and America with a short duration of four to five years. A number of other countries have also taken up research on this plant.

In India, the anticancer activity of sea buckthorn was discovered in early 1971 by an Indian scientist. It is unfortunate that since then there has been no follow-up, despite the fact that this plant is available in abundance in India. Sea buckthorn grows naturally along riverbanks and on slopes in the Lahual, Spiti, Chamba and Kinnaur districts, as well as in other parts of the state. It also grows in the wild in Ladhak and the Uttar Pradesh hills.

It was only in January 1994 that India discovered the value of this medicinal plant when a Chinese scientist made a presentation on the importance and high medicinal values of sea buckthorn at the first consultation meeting organized by the State Council for Science, Technology and Environment at Shimla. Thereafter, the State Council created considerable awareness about the potential of sea buckthorn in the tribal areas of the state.

With the aim of developing and protecting sea buckthorn, the State Council set up a task force involving scientists from universities in the state. Subsequently, research on various aspects of sea buckthorn was also taken up in the Regional Research Station of HPKVV (Indian Agricultural University) at Kukamserri in Lahual and Spiti. A sea buckthorn nursery and plantation were developed by the scientists there.

It is high time that the state government and both the universities of the state encourage and give special attention to the scientists working on the research and development of sea buckthorn. There should also be studies on the economic utilization of this plant and on greening the wild deserts of tribal areas of the state. (*Source*: My Himachal – Sirmour [Himachal Pradesh], 22 August 2009.)

SHEA NUT (*BUTYROSPERMUM PARKII*)

Charcoal burning threatens shea tree in Uganda

Kampala. Cultural law protects it. Village elders forbid their people from cutting it. Locals say that if the tree is cut, a drought will descend upon the land and a curse placed upon the cutter. But, today, despite all the efforts of local leaders, the much adored shea tree (*Butyrospermum parkii*) in this northern part of the country is under threat. Yet, with its natural ability to yield nuts for up to 300 years and produce oil, the shea nut tree is a godsend to the locals here.

When people lived in Internally Displaced People (IDP) camps, the bylaw protecting the shea nut tree was disregarded. Elders were dispersed, diluting their power, and rebels made searching for firewood highly dangerous. As a result, people in IDPs cut down the trees closest to the camp, and the much honoured shea nut tree was not spared. Today, the land around camps is alarmingly dry and treeless.

Adding to this pressure, the charcoal trade is booming as peace reigns and people return to their homes. "Before the camps, people were going for agriculture, but now they need immediate money so they turn to charcoal burning and selling," says Samuel Abwola, the district forestry officer in Gulu.

In the past, charcoal burning was considered a lowly job but as harvests fail under the scorching sun, for many it has become the only source of livelihood. "Women, men, young, old, anyone can burn charcoal. It just needs energy," says Abwola.

Hardwoods, like the shea nut tree, are especially popular because they produce heavy charcoal that burns for a long time and produces strong heat. Despite the booming charcoal trade and the desirable charcoaling qualities of the shea nut tree, some village elders are trying to implement the cultural law protecting the tree once more.

Akena John Bosco has been burning charcoal in his village of Loyoajong for the past three months. He does the charcoal burning all by himself, from cutting the tree, to heating it in the traditional kiln, to packing it in plastic sacks. He does not cut down the shea nut trees for charcoal because of the strong leadership in his village. "When you cut a shea nut tree, the local leaders demand a fine of Sh50 000 or ask you to slaughter a goat," he says, as he covers his charcoal sack with dry grass.

Shea nut oil is central to the northern way of life. Most women in Loyoajong make shea oil, which is used for cooking and moisturizing babies' skin. Mothers send their children out to collect the nuts, which they then dry, pound and cook to obtain the oil. According to a village elder, Nyeko Livingstone, 69, the oil is also used in many traditional ceremonies. "When someone dies of an illness, the surviving family members are smeared with shea," he says.

Despite the growing protection of certain species, trees are turning to charcoal. According to Abwola, local leaders should be supported in their efforts but tree protection is not enough. "We want to have people come together to replant the area where they cut trees for charcoaling," he says, adding that, without replanting, the trees will disappear, and so will the charcoal trade. (*Source*: AllAfrica.com, 30 August 2009.)

Shea butter empowerment and knowledge for women

While Africa is still far from having adequate capacity for scientific innovation, women are more and more present in the field of the continent's sustainable development.

According to Dr Alhadji Wareme from Burkina Faso, knowledge is not the exclusive preserve of universities and the like, but is also to be found by building on traditional techniques and craftsmanship. He says women's groups have made enormous strides in this regard in Burkina Faso, notably in the production of shea butter.

"The *filière* (producer to consumer chain) for shea butter produced by women's organizations offers major opportunities in terms of invention and wealth creation in a rural or urban setting, providing livelihoods for women in particular, and a source of foreign currency for the country due to growing export demand," he told Inter Press Service (IPS). (Improving shea butter production in Burkina Faso – and neighbouring Mali and the Niger – has been directed towards improving joint action throughout the sector, from producers through processors, distributors, exporters and consumers: the entirety is referred to in French as a *filière*.)

The foundation of these productive advances, Wareme underlines, is in traditional knowledge. According to him, Burkinabe women have long processed shea nuts for butter. With assistance from a development partner, the International Development Research Centre, these women have improved production techniques, using manure and taking better care of the health of the trees, as well as speeding up the extraction process, using a machine press.

Warame continues: "Women's groups, combining traditional and modern techniques, have succeeded in creating something good in the shea butter *filière*. What's needed now is a programme to share these techniques more widely". (*Source*: IPS, 4 August 2009.)

WILDLIFE

Forest animals threatened by habitat loss and poaching

Forests are among the most biologically rich terrestrial ecosystems. However, deforestation, forest degradation and poaching mean that habitats are lost and the survival of many forest species is increasingly threatened.

The World Wide Fund for Nature (WWF) has identified more than 200 ecoregions as outstanding examples of the diversity of the world's ecosystems; of these, forest regions make up two-thirds of the total. Yet, while forests contain more than 80 percent of the world's terrestrial species, the survival of many of them is threatened.

The Convention on Biological Diversity (CBD) estimates that the accelerating rate of deforestation that has taken place over the last century has contributed to reducing the number of forest species by more than 30 percent. The rate of species loss in forest regions is considerably faster than in other ecosystems. Between now and 2050, it is projected that there will be a further 38 percent loss of forest species.

The conversion of forests for agricultural use and plantations, fires, pollution, climate change and invasive species all impact forest biodiversity. Fragmentation of forests as a result of roads, agriculture and the development of human settlements also impact wildlife by reducing the corridors used to move or migrate. In Indonesia, over the period 2001–2007, forest clearance, including illegal logging, was found to be taking place in 37 out of 41 national parks, threatening many species and driving the orang-utan towards extinction. The decline of the orang-utan and the destruction of its habitat have reached such a level that wildlife conservationists have set up so-called "orang-utan refugee camps" in certain areas.

Animals living in the forest are also at risk from poaching and bushmeat hunting. In Africa, the bushmeat consumption per capita is higher in logging and mining areas, as the workers are often able to afford bushmeat. Networks of logging roads and tracks also provide hunters with easier access to abundant wildlife areas. As a result, commercial and subsistence hunting can quickly reach unsustainable levels, leading to local extinction of the targeted wildlife species. In Central Africa, species in danger not only include the larger mammals, such as elephants, rhinoceroses, great apes and other primates, but also porcupines, cane rats, pangolins, monitor lizards and guinea fowl. Bushmeat hunting and trading have now become big business and are one of the main threats to many of the major species in Africa.

As mentioned, a species under threat from poaching is the rhinoceros. Rhinoceros horn is used in traditional Asian medicine, believed to reduce fevers and even prevent loss of life. Other parts of the rhinoceros, including the skin and bones, are also used for their supposed medicinal qualities. Demand for rhinoceros horn has increased substantially in recent years. Of the five species of rhinoceros, three are listed in the IUCN Red List as critically endangered. Poaching is not the only way by which rhinoceros horn finds its way to the market. In certain instances and limited to specific populations, trade in the horns derived from the hunting of rhinoceros is allowed under CITES. However, recent investigations have shown that hunters are abusing regulations and taking the horns into commercial trade, involving organized crime, corruption, abuse of diplomatic privileges and money laundering.

Intelligence gathering, regular monitoring and strict enforcement are effective ways of curtailing both illegal logging and poaching activities in forests.

The participation of local communities in these activities can facilitate implementation of laws and regulations and secure sustainability. Customs enforcement also plays a critical role in controlling trade in various species. (*Source: Vital Forest Graphics*. 2009. UNEP, GRID-Arendal.)

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Orang-utans use leaves to make "music" to mislead predators

A new study shows that wild orang-utans in Borneo hold leaves to their mouths to make their voices sound deeper than they actually are, making them, apart from humans, the only animals known to use tools to manipulate sound.

The orang-utan's music, if you can call it that, is actually an alarm call known as a "kiss squeak". "When you're walking in the forest and you meet an orang-utan that is not used to humans, it'll start giving kiss squeaks and breaking branches," says Madeleine Hardus, a primatologist at the University of Utrecht in the Netherlands, who has spent years documenting the practice among wild apes in Indonesian Borneo.

She contends that orang-utans use leaves to make these kiss squeaks to deceive predators (such as leopards, snakes and tigers) as to their actual size – a deeper call indicating a larger animal. (*Source: The Times of India*, 6 August 2009.)

Gorilla dung critical to containing climate change?

A leading United Kingdom wildlife expert said today that protecting the large primates he called the "gardeners of the forest" could provide the easy fix for global warming envisaged by international reforestation programmes.

The United States of America and other industrialized countries are looking to reforestation programmes in Africa, Southeast Asia and South America to help contain the effects of climate change. But Ian Redmond, the UN ambassador for the Year of the Gorilla, said the industrialized countries would be making a mistake if they did not commit specific funds to

protecting the gorillas as part of the discussion on reforestation efforts at the climate change negotiations in Copenhagen next December.

"If we save the trees and not the animals, then we will just see a slow death of the forests," Redmond said. "What I am urging the decision-makers at Copenhagen to consider is that the gorillas are not a luxury item. If you want a long-term healthy forest you have to take action to protect them."

The gorillas were crucial to fighting climate change, he said. Gorillas, which are herbivores, feed on fruit and plants. The digested food, as it passes through their systems, helps seeds to germinate.

The full extent of the gorillas' role in propagation is unclear. But Redmond said a number of plant species could not flourish without them, or wild elephants, the other large mammal crucial in germination.

The gorillas – caught up in the region's civil wars, preyed on by poachers and crowded out of their homes by mining and logging industries – are already endangered across Africa. But Redmond's argument could help give the animals a new level of protection.

The world's forests act as a natural trap for carbon emissions, sucking up some 4.8 billion tonnes of carbon a year. Economists such as Lord Stern have said that spending about US$15 billion a year on reforestation programmes would be the cheapest way of cutting greenhouse gas emissions. In the run-up to the meeting on climate change in December, there has been a growing focus on reforestation programmes in Africa, Southeast Asia and South America.

However, there has been no direct recognition of the role played by large animals – such as gorillas – in propagating plants on the jungle floor.

Redmond said gorillas were crucial to maintaining the lifecycle of the rain forests in the Congo Basin. The forests themselves suck up more than 1 billion tonnes of carbon every year. "This is what the species are for. They are not ornaments. They are not just interesting things to study. They are part of an ecosystem," he said.

All of the big apes are now considered endangered. Nearly 20 years of civil war in the Great Lakes region of Africa have seen an explosion in illegal mining and logging by militias seeking money for guns.

Two gorillas are killed in the Democratic Republic of the Congo each week and their corpses sold as bushmeat, an investigation by Endangered Species International found. Many gorillas live outside the relatively small protected enclaves of national parks. These gorillas are losing their habitat because of rapid urbanization. Villagers are venturing deeper into the forest to cut down trees for cooking charcoal. (*Source*: Guardian.co.uk, 13 October 2009.) ♣

Patience is power; with time and patience the mulberry leaf becomes a silk gown.

Chinese proverb

ARGENTINA

Argentina's forest diversity

Argentina stretches across many lines of latitude and, as a result, encompasses a diversity of climates and soil types. It is this geographic diversity that fosters the more than 30 million ha of temperate, subtropical, humid and semi-arid native forest.

In the north of the country is the Chaqueño parkland, forming deciduous xerophilous stands with scrubland, grassland and palm stands. Species present here include various types of *quebracho* (*Schinopsis* spp.), carob (*Prosopis* spp.) and pink *lapacho* (*Tabebuia avellanedae*).

In the northeast of the country, Tucumano-Boliviana rain forests form submontane and montane subtropical forests with altitude determining the composition of mixed forest. Species found here include cedars (*Cedrela* spp.), pink *lapacho*, jacaranda (*Jacaranda mimosifolia*) and *cebil* (*Anadenanthera colubrina*). There are alders (*Alnus acuminata*) above 1 200 m, while mountain or Tucumán pine (*Podocarpus parlatorei*) can be found up to 1 900 m.

The Misiones subtropical rain forest is also found in the northeast. It contains mixed subtropical forests with high levels of biodiversity and multistorey stands 20–30 m tall. In addition, the province of Misiones has a considerable area of forest plantations producing fast-growing species, particularly *Pinus elliottii* and *P. taeda*.

Just south of Misiones is the province of Corrientes, which has the most extensive area of forest plantations. The province of Entre Rios, bordering Corrientes, has a large area planted with various species of eucalyptus, together with a well-established industry.

Andino-Patagónico forests are found along the Andes from latitude 37º south, southwards to Tierra del Fuego. These forests contain such species as the monkey puzzle or *pehuén* (*Araucaria araucana*) and various species of the *Nothofagus* genus, which are found as far south as Tierra del Fuego.

Espinal scrubland forms deciduous xerophilous woodland interspersed with palm stands, grassy savannah, grassy steppe and bushy steppe. This region can be subdivided into three regions, the first dominated by *ñandubay* (*Prosopis affinis*), the second by *carob* and the third by *caldén* (*P. caldenia*).

Argentina has legislation (Law 26.331 and Law 25.080) that protects the country's native forests and establishes various categories for their use, ranging from strict conservation to the possibility of sustainable harvesting. Forestry incentives are established by means of non-repayable grants to producers for planting trees and such silvicultural activities as pruning, thinning, coppicing and the enrichment of native forests. (*Source*: XIII World Forestry Congress announcement, www.wfc2009.)

AUSTRALIA

Australian truffle harvest in full swing

Australia's black truffle harvest is in full swing, with growers tipping a bumper crop of the revered fungus this winter.

Australia's truffle pioneers are in Tasmania, which produced the country's first *Tuber melanosporum* in 1999 after plantings began in 1991. Peter Cooper from Périgord Truffles of Tasmania is predicting a best-ever national harvest for 2009 of about 1.5 tonnes. Europe produces up to 60 tonnes of black truffles during its annual winter harvest.

The feather-light truffles have a three-week fresh shelf-life and fresh is considered best, although truffles can be preserved.

Mr Cooper said prices for Australian truffles have so far withstood an impact on demand caused by the global financial crisis. They will sell this season for about AU$2.50 per gram, he said.

Tasmanian truffles, sniffed out from under oak and hazel trees by dogs, are picked in the morning and packed and shipped the same day. The clock on freshness is ticking as soon as they are plucked from the earth.

Mr Cooper said they can be anywhere in Australia within 24 hours and anywhere in the world within 48 hours of harvesting. Most of them will be sold overseas, through Asia and into Europe.

A black truffle varies in size from 2 cm in diameter to the size of a grapefruit and is covered in black warts; its appearance indicates nothing of its true value.

The truffles, which form annually, are found just below the soil surface to a depth of 20 cm and are believed to develop their best characteristics in cold soil. (*Source*: Food Week Online, 24 July 2009.)

Wattle and myrtle beers

For over 6 000 years, Australian Aborigines in different clans around the country parched and milled wattle seeds (*Acacia* spp.) from around 100 of the 900 plus species of acacia, then used the coarse flour in baked seed cakes. Wattle seed has an unusually low glycaemic index, which means that the carbohydrates in it are slowly absorbed and therefore better for one's health than sugary, quick-release alternatives.

Wattle seed is now being used by Barons, an Australian brewery, in one of its ales, Barons Black Wattle.

The same brewer uses another little-known NWFP in its Witbier: lemon myrtle leaves. Lemon myrtle (*Backhousia citriodora*) is a flowering plant native to the subtropical rain forests of Queensland, Australia. It is considered to have a "cleaner and sweeter" aroma than comparable sources of citral (such as lemongrass). Lemon myrtle is one of the well-known bushfood flavours and is sometimes referred to as the "Queen of the lemon herbs", with the new growth preferred for its sweetness. (*Source*: Lehrman Beverage Law [Australia], 29 June 2009.)

BANGLADESH

Present status of NTFPs species stock in Sylhet Forest Division: a case study from Juri Forest Range-2

The exploitation of NTFPs is less ecologically destructive than timber harvesting and therefore provides a sounder basis for sustainable forest management. Research reveals that NTFP cultivation can bring concrete ecological benefits, e.g. it can encourage natural regeneration and mimic natural forest ecosystems in plantations and afforestation sites.

A study was carried out in the Juri Forest Range-2, Sylhet Forest Division, to explore the existing numbers of cultivated NTFP species. The NTFPs in the study area were bamboo, cane, sungrass and *murta* (see table).

Stock of NTFPs in Juri Forest Range-2

Local name	Scientific name	Family	Average no. of culm/ha	Average no. of clump/ha	Average no. of culm/clump (mean±SD)	Average circumference of each clump (m) (mean±SD)
Jai bamboo	*Bambusa vulgaris* Schrad.	Graminae	7 545	373	25(±6.016)	3.02(±0.884)
Dulu bamboo	*Neohouzeaua dulloa* (Gam.) Camp.	Graminae	3 144	153	27(±5.422)	7.13(±1.923)
Muli bamboo	*Melocanna baccifera* (Roxb.) Kurz	Graminae	8 867	–	–	–
Jali bet	*Calamus guruba* Ham.	Palmae	4 950	224	25(±6.016)	3.02(±0.884)
Sungrass	*Imperata arundinacea*	Graminae	8 482	534	18(±5.59)	4.10(±1.02)
Murta	*Schumannianthus dichotoma*	Marantaceae	710	72	22(±5.67)	6.81(±1.98)

The study found that there were six species under three families of available NTFPs in the study area. The dominant family was Graminae, with four species, followed by Palmae and Marantaceae (one species each).

Communities living in or around the forests have been collecting various forest products, mainly NTFPs, for their subsistence as well as for commercial use. Selling NTFPs has been the most widespread way in which rural people in the study area earn a cash income and whereby new development opportunities are created.

However, NTFP resources are declining at an alarming rate because of overexploitation. Tropical countries such as Bangladesh do not have enough information on their stock of NTFPs. Therefore, in order to prepare a proper forest management strategy, assessments of NTFPs in the whole country are extremely important. (*Contributed by*: Md. Parvez Rana and Mohammed Salim Uddin, Department of Forestry and Environmental Science, School of Agriculture and Mineral Sciences, Shahjalal University of Science and Technology, Sylhet 3114, Bangladesh. E-mail: parvez_200207@yahoo.com)

BHUTAN

Action over prayer flags

The Bhutanese Government has warned its citizens not to cut down thousands of young trees each year to make poles for hoisting Buddhist prayer flags. It said that the felling of trees is a threat to the tiny kingdom's beauty and undermines the government's duty to promote "gross national happiness".

The flags are flown by Himalayan Buddhists to help the dead find the right path in their next life. They believe that the more flagpoles put up for the departed the better. Buddhist monks say that fresh poles must be used each time.

Government figures show that between June 2007 and June 2008, 60 178 trees – about 165 every day – were felled to meet the demand for poles. About 550 trees were felled daily for other uses.

"There's an immense pressure on the forest," Department of Forests spokesman Gopal Mahat told the *Kuensel* newspaper. "We can't stop granting permits, especially for important religious rites because it involves sentiments," he said. "The demand is for straight, young trees, which have the potential of becoming crop trees."

Many Bhutanese Buddhists believe that the ideal number of prayer flags for deceased people is 108, preferably made from freshly cut trees.

Officials warn that this approach means that most of Bhutan's forest will be gone within the next 20 years and that trees are already being cut down deeper and deeper within forests. The problem has become so serious that forestry officers in the capital, Thimpu, have restricted the number of prayer flagposts to 29.

Plans are also afoot to persuade people to switch to bamboo for prayer flags, but a similar initiative recently launched to encourage people to use steel was unsuccessful.

Bhutan's constitution, which emphasizes the importance of gross national happiness over gross domestic product, stipulates that the country must have at least 6 percent forest cover. (*Source*: BBC News, 11 September 2009.)

Forest products to help alleviate poverty

Farmers from Trongsa will no longer have to go to Zhemgang divisional forest office to ask for permission to use forest products as in the past. This time- and cost-saving measure will be made possible after the Department of Forests (DoF), with a strong focus on delivery of services through decentralization, allows the territorial forest offices to issue permits.

This move to improve service delivery is one of the sub-themes discussed at the Second Annual Forestry Conference held in Zhemgang from 29 to 31 October. "The DoF is making it simple and convenient for the farmers," said the nature conservationist, Dr Sangay Wangchuk.

With the main theme of "Managing Forestry Resources for Poverty Alleviation", forest officers will also sort out how to enhance access to forest resources, especially NWFPs, by the community. "Clear-cut guidelines and frameworks for the use of forest products and marketing will be framed," said Dr Wangchuk.

NWFPs include cane and bamboo products, various medicinal plants, *Cordyceps*, mushrooms and different species of ferns. Dr Wangchuk said that, to date, lack of guidelines and frameworks restricts people from using forest resources. "Giving farmers access to harvest forest resources would generate income to the community, which would help in poverty alleviation," he said.

The chief forestry officers, park managers, *dzongkhag* (district) forest officers, senior range officers and representatives from the World Wide Fund for Nature (WWF), Helvetas and SNV (Netherlands Development Organization), will also discuss issues such as sustainable forest management and linking conservation activities to livelihood, by developing strategies for income generation through ecotourism and urban recreational centres.

The conference will also discuss emerging issues such as the role of forest resources in poverty alleviation, payment for ecosystem/environmental services and making conservation programmes sustainable through programmes such as ecotourism and urban recreational centres.

Bhutan has 72 percent forest cover, with 64 percent tree cover and 8 percent degraded forest. (*Source*: Kuenselonline [Bhutan], 30 October 2009.)

Interim framework for the collection and management of NWFPs

A central region training workshop on the interim framework for the collection and management of NWFPs was organized jointly by the Netherlands Development Organization (SNV) and the Social Forestry Division (SFD) of the Department of Forests at Tsirang *dzongkhag*. The workshop for the central region covered Tsirang, Sarpang and Zhemgang *dzongkhags*. The overall objective of the training was to strengthen the sustainable harvesting/collection, management, marketing and trade of NWFPs.

A start has to be made for the sustainable use and harvesting of these NWFPs, while at the same time resource assessments must be initiated to provide collection and harvesting guidelines for forestry field personnel and collectors. This framework is being developed for the collection/harvesting of NWFPs from Government Reserved Forests (GRFs) and from Private Registered Land (PRL). The framework for collection of NWFPs from GRFs is an interim measure for a maximum period of three years. During this time, a Community Forest Management Plan for the collection/harvesting of NWFPs should be prepared, wherever feasible.

The framework is being developed to guide NWFP collection, using a system of permits, and guide forestry personnel in the field in order to strengthen the sustainable harvesting, collection, management, marketing and trading of NWFPs. (*Source*: Ministry of Agriculture [Bhutan], 11 June 2009.)

BOTSWANA

Traditional doctors are engaged in research on traditional knowledge

The Centre for Scientific Research, Indigenous Knowledge and Innovation (CESRIKI) is carrying out research in Maun that seeks to address indigenous knowledge systems (IKS) as a vital source of knowledge adapted over centuries and strongly rooted in cultural and social relations. Maun and the Okavango Delta were selected because they represent areas of ethnic and cultural diversity, as well as an enormous biodiversity.

CESRIKI recognizes the wealth of knowledge that needs to be explored, documented and studied, as well as modernized, so that it contributes maximally to the benefit of communities in terms of development, innovation and entrepreneurship and enables traditional doctors to express their views in decision-making.

The Okavango research would also help in documenting, evaluating, validating and protecting widely practised IKS and also in identifying problems associated with their use that could serve as researchable topics to find appropriate solutions, as well as create an IKS database to ensure future access for IKS practitioners, community representatives and researchers.

Traditional doctors are involved as research partners. Activities carried out include consultative workshops, sampling of different plant medicines and testing. This will give the traditional doctors insight into how dangerous or helpful their plants could be. Ngaka Seputhe from Maun and many others will share their knowledge with researchers. Ngaka Themba said he is very happy as this showed some development and a sense of recognition and appreciation. He said this bears testimony to the fact that their profession is indeed worthy and is now given the benefit of the doubt. He said they want to build up cooperation with both the researchers and the University of Botswana.

The traditional doctors affirmed that they have learned a great deal about plant activities and their toxicity. However, they were concerned that their medicinal plants will become extinct once people learn about them from the research. They called upon the authorities to find ways to preserve endangered plant species from harvesters. Another challenge faced by these doctors is that most of them do not have a formal education.

The research exposed the need to establish contacts with IKS practitioners in various parts of the country to explore appropriate modalities for interaction as well as with community leaders and members, and to develop a solid base for long-term and mutually beneficial relationships that are transparent and respectful. (*Source*: University of Botswana, 22 October 2009.)

BURKINA FASO

Determinants of access to forest products in southern Burkina Faso

There is an increasing understanding that forests and the forestry sector are key elements in poverty reduction strategies in Africa. However, issues of equity between various forest users are becoming a major challenge to environmental development, forest management and poverty reduction.

A recent paper presents an analysis of household representatives' socio-economic determinants and other constraints on accessing forest products, based on data collected through a questionnaire survey of 1 865 respondents in seven districts of the Sissili province, southern Burkina Faso. Three logistic regression models were developed to examine determinants of access to the forest for collecting fuelwood, grazing livestock and collecting NTFPs.

The results showed that access to forest products is associated with individual characteristics. Age, ethnicity, occupation and sources of income were significant determinants of access to all types of forest products. Access to the forest for grazing livestock was further influenced by gender and household size, while access to NTFPs was influenced by gender, household size and education level of the respondents. The formal forest law that precludes grazing in the forest, and customary rules and regulations pertaining to land tenure, were reported to be serious constraints to forest access for women and migrant people. Understanding the factors influencing access to products from commonly owned forest resources could be the basis for developing, modifying and targeting policy instruments that promote equitable access. Policies should particularly encourage the direct involvement of vulnerable and marginalized groups (women and migrants) in forest management activities. (*Source*: Pascaline Coulibaly-Lingani, Mulualem Tigabu, Patrice Savadogo, Per-Christer Oden and Jean-Marie Ouadba. 2009. Determinants of access to forest products in southern Burkina Faso. *Forest policy and economics*, 11[7]: 516–524.)

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CAMBODIA

First rattan association in Cambodia, a step to a sustainable rattan industry
Phnom Penh. Eleven small and medium enterprise rattan owners and other community rattan processors from Phnom Penh and the provinces met on 28 September 2009 officially to form Cambodia's first rattan association.

"While the association is perceived by members as creating space and opportunity for key actors in the rattan production chain to meet and work together, this institutional initiative is described as a fundamental first step to achieve the goal of maintaining a sustainable production and supply of rattan. We are delighted to support this project and this activity in particular," said the representative of the European Commission's Delegation in Phnom Penh.

"The formation of the rattan association is critical to ensure understanding of community suppliers, processors and traders about the need to maintain a sustainable supply of rattan for a clean and better production," said Mr Lip Cheang, a founder of the rattan association and owner of the Kampuchea Samay Thmei rattan factory.

Fast growing economies elsewhere in the region are motivating the rapid expansion of processing activities, leading to a demand for rattan resources at an unsustainable level. There is an urgent need to establish a model of sustainable production that can support the continuous growth of rattan in forests, while maintaining seasonal harvesting and a sustainable supply.

"This is the right time to move forward with concrete actions that will help the development of the rattan industry of Cambodia to export clean and high-quality products into international markets, while continuing to manage rattan resources sustainably in the forest," said Mr Ou Ratanak, Rattan Project Manager from WWF.

The rattan association will first of all put a legal identity to a group of rattan suppliers and processors, which is important for their recognition by national and international societies.

"One of the project's major objectives, funded by the European Union, is to engage small and medium enterprises in cleaner production, with the aim to introduce proper techniques in processing activities to ensure quality assurance," said Mr Thibault Ledecq, Rattan Programme Manager from WWF. (*Source*: WWF International, 1 October 2009.)

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CAMEROON

Le développement des petites et moyennes entreprises camerounaises impliquées dans la filière des PFNL de nature végétale
Avec un massif forestier d'environ 22 millions d'hectares, le Cameroun possède la deuxième plus grande surface forestière en Afrique centrale. Outre le bois d'œuvre, la forêt camerounaise fournit de grandes quantités de produits forestiers non ligneux (PFNL) qui contribuent à la vie de nombreuses populations rurales en tant que source importante de revenus, aliments, remèdes, etc.

A l'heure actuelle, les populations ont un droit d'usage reconnu sur les PFNL en vue de subvenir à leurs besoins domestiques. La commercialisation et/ou la vente des produits sont interdits dans ce cadre. Toutefois, la FAO et le Ministère de la forêt et de la faune (MINFOF) camerounais s'attellent à élargir ce droit d'usage de manière à autoriser une commercialisation limitée des PFNL. Cette démarche s'inscrit dans le processus de relecture de la politique forestière et des textes de la loi forestière de 1994.

Aujourd'hui, le Cameroun constitue un important marché de PFNL aux niveaux local, national et international. En effet, ces dernières années ont vu naître une nouvelle approche, axée sur la création de petites et moyennes entreprises (PME) impliquées dans les filières des PFNL de nature végétale (Irvingia spp., Prunus africana, etc.). Situées généralement dans les maillons de production et de commercialisation de la chaîne de valeur, ces PME sont cependant à un état embryonnaire et leur développement se heurte encore à de nombreux obstacles. De ce fait, à travers le projet GCP/RAF/408/EC «Mobilisation et renforcement des capacités de PME impliquées dans les filières des PNFL en Afrique centrale», lancé,par la FAO, l'Organisation néerlandaise de développement (SNV), le Centre mondial d'agroforesterie (ICRAF) et le (Centre pour la recherche forestière internationale (CIFOR), de nombreuses actions ont été mises en œuvre pour renforcer leurs capacités.

A cet égard, nous avons effectué une évaluation de l'impact du renforcement des capacités de ces PME, dans le cadre d'une étude menée pour l'obtention du Master 2 en analyse et évaluation de projets. Il en ressort que les PME évaluées ont amélioré considérablement leur chiffre d'affaires annuel, qui est passé de 65 789 USD en 2007 à 243 421 USD en 2008. Le nombre d'emplois induits est passé de 162 en 2007 à 238 en 2008. Les difficultés rencontrées sont toutefois encore importantes, notamment:

- **L'instabilité de la production des PFNL:** Il s'agit d'un problème crucial susceptible d'entraîner le désengagement des acteurs de la filière, la perte des débouchés, etc. La domestication serait donc un facteur important du développement des filières.
- **L'exploitation illégale des PFNL:** Nombre de PME ne disposent pas d'un permis d'exploitation des PFNL. Sur 36 PME enquêtées dans cinq villes, seule l'une d'entre elles détient un permis personnel et 12 utilisent le permis de l'association à laquelle elles appartiennent.
- **L'insuffisance des capitaux d'investissement:** La majeure partie des fonds investis vient de l'acheteur, qui finance à l'avance l'achat des PFNL et impose de ce fait les conditions de marché.

(*Contribution de*: Nathalie Diane Nzouengo, Experte en analyse et évaluation de projets, Programme sur les PFNL en Afrique centrale, P.O.B. 281, Représentation de la FAO au Cameroun, Yaoundé, Cameroun. Courriel: nath2825@yahoo.fr)

Baka pygmy population says: "Our lives are defined by this forest"

Pauline Siembe, a Baka pygmy in southeast Cameroon, comes out of her smoky hut, licking her fingers after a meal of pounded yam and bushmeat soup. A bright smile lights up her face, revealing an array of sharp-pointed teeth, intentionally sharpened to eat bushmeat. "It always feels good eating a meal like this," she remarks, as she straps a basket on her shoulder and heads for the forest. Her husband, Daniel Njanga, wiping his mouth with the back of his hand, still savouring the meal, says: "This is what the government wants to deprive us of".

Taking on a more serious look, Njanga spits out his disdain for the government's methods of conserving the vast forest reserves of southeast Cameroon that straddle two of the country's "divisions", the Boumba and Ngoko and the Upper Nyong divisions, all in Cameroon's east region, and part of the Congo Basin rain forest. "This is our home and there is no point telling us that we should not access it."

"If we are talking about conservation, then the Bakas are the best conservationists. We have been living here since time immemorial, and the forest has not disappeared. Those who now claim they are conserving the forest are the same people pillaging our forests. We see sawmills felling large portions of our forest every day. Is it not this same government that authorizes the felling?" he asks.

Njanga is obviously angry that the forest has been gazetted into three national parks and 23 logging concessions, totalling some 760 000 ha. While logging concessions are designed to foster sustainable timber exploitation – in fact, operators are supposed to plant ten trees for every one felled, although the provision is frequently violated – national parks create even stricter restrictions, as access is forbidden. These restrictions pose a threat to the Bakas, who now have to grapple with new challenges.

By the forestry law of 1994, national parks fall under the sphere of permanent forest domain. The law explicitly states: "Public access to state forests may be regulated or forbidden". The more than 30 000 Baka pygmies who live in the region see these restrictions as an affront to their right of access to the forest that they consider their natural home.

"Our lives are defined by this forest. We harvest fruits, wild tubers, honey and medicine from the forest. And we kill animals for our basic food needs. We

destroy nothing. We get only what we need from the forest," Siembe says.

Gilbert Ngwampiel, a Baka man in Ngoyla, near the Nki National Park, says: "If the government says we should not hunt animals, it is a way of exterminating the Bakas. Eating bushmeat makes Baka men fertile. Failing to eat meat means that the Baka man will not be able to impregnate his wife, and this is dangerous".

"Of course we want these animals to continue living here," Ngwampiel says, when asked whether the Baka hunting techniques would not perhaps lead to the extinction of some species. "We kill only enough animals to eat, and we don't kill all animals. We hunt only male animals, the females and the babes are left for posterity. Those who kill animals indiscriminately are those who want to go and sell, and they are not the Bakas – they are the Bantu."

Olivier Tegomo, a junior research assistant for WWF, who was at the forefront of a study that recommends a shift in conservation paradigms, said he worked closely with the Bakas to find out what the forest really represented for them. "All this has to do with the notion of participatory forest management. We had to find out the types of products they get from the forest, where these products are concentrated, and how they could exploit those products without threatening the forest ecosystem. Along with the Bakas, we have come up with a participatory map that localizes all their interests in the forest."

Leonard Usongo, former WWF coordinator for the WWF-Jengi Conservation Project of southeast Cameroon, who supervised the study, says any conservation paradigm that does not take into consideration the sociocultural needs of the people is built on the wrong premise. "The solution that works is that which still allows the indigenous people access to forest products, although we have to encourage them to do so sustainably." (*Source*: AllAfrica com, 4 October 2009.)

Production et commercialisation des PFNL par les populations pygmées baka de la zone du Grand Djoum (sud du Cameroun)

La zone du grand Djoum dans le sud du Cameroun constitue l'un des plus importants bassins de production de PFNL tels que l'*Irvingia* spp. (mangue sauvage), le *Pentacletra macrophylla* (ebai) ou le *Ricinodendron heudelotii* (njansang). Ces produits sont exploités par les Bantu et les pygmées Baka.

En général, les Baka représentent 30 à 50 pour cent de la population dans chaque zone où ils sont établis. Ils sont de grands collecteurs de PFNL, du fait de leur parfaite maîtrise de la forêt et de ses ressources (fruits, écorces, miel, feuilles). Ils prélèvent ces dernières de manière traditionnelle, puis les réservent à l'autoconsommation ou bien les vendent à vil prix ou les échangent contre du sel, de l'huile, du savon, des cigarettes et de l'alcool. La commercialisation des PFNL par les Baka n'est pas équitable, en raison de l'absence d'organisation, de l'analphabétisme, du manque d'informations sur le marché, etc.

Ainsi, à travers le projet GCP/RAF/408/EC «Mobilisation et renforcement des capacités de PME impliquées dans les filières des PNFL en Afrique Centrale», la FAO, la SNV, le CIFOR et l'ICRAF œuvrent-ils pour intégrer les minorités Baka dans la filière des PFNL. C'est dans cette optique que, dans le cadre d'une étude menée pour l'obtention du Master 2 en analyse et évaluation de projets, nous nous sommes penchés sur 54 ménages Baka producteurs de PFNL, afin d'évaluer les impacts socioéconomiques de leur implication dans l'exploitation de ces produits.

D'après cette étude, la situation actuelle des Baka n'est pas la même qu'il y a quelques années, où ils étaient considérés comme des sortes d'esclaves et ne profitaient pas des fruits de la commercialisation des PFNL. Actuellement, ils y trouvent une opportunité de positionnement. Cela se ressent notamment dans des expressions employées par les Baka du grand Djoum, qui disent par exemple: «on nous a ouvert les yeux»; «on négligeait de l'or sans savoir»; «on ne va plus nous tromper». Le plus important pour eux est de voir leurs efforts récompensés par un achat des PFNL à des prix équitables: ainsi, le seau de 5 litres d'*Irvingia* spp. est acheté entre 2 et 11 USD chez les Baka quand il est revendu entre 15 et 35 USD en ville. De même, le seau de 15 litres de

Pentacletra macrophylla est acheté en moyenne à 3 USD alors qu'il est revendu à 9 USD.

L'étude montre que les associations Baka sont devenues des acteurs de la filière des PFNL. Leur participation à cette dernière demande toutefois à être favorisée et accrue. D'où la nécessité de renforcer leurs capacités en matière d'organisation et de gestion, de les former davantage sur les techniques de production et de les intégrer effectivement dans le Système d'information sur le marché. (*Contribution de*: Younchawou Ngouwouo, Conseiller en développement, Expert en analyse et évaluation de projets, Programme sur les PFNL en Afrique centrale, P.O.B. 281, Représentation de la FAO au Cameroun, Yaoundé, Cameroun. Courriel: maximemoussavou@yahoo.fr)

CANADA

Goods from the woods: Manitoba Model Forest hosts introductory NTFP workshops

In March and April 2009, the Manitoba Model Forest (MbMF) held a series of six workshops on NTFPs in communities around the model forest area. The workshops were very successful, with more than 150 people attending, and generated great interest in opportunities from the forest. The workshops represented a collaboration between MbMF, the Centre for Non-timber Resources at Royal Roads University (Victoria, British Columbia), the Manitoba Forestry Association and the Woodlot Association of Manitoba.

Participants learned about a wide variety of topics related to NTFPs, including: what are NTFPs, local and international marketing, adding value to products, and an exploration of what is in your community's backyard. They also gained some hands-on experience in growing their own *shiitake* and oyster mushrooms on logs and tapping Manitoba maple trees for sap and the production of maple syrup. There were opportunities to sample ice cream with Manitoba maple syrup, and herbal tea from the Russian Federation. Some participants attended the workshops out of interest in starting up a business, while others attended to learn about NTFPs for their own use.

The workshops are part of a longer-term plan to build capacity and expertise in NTFP businesses in the model forest area. A new curriculum on NTFPs is being developed by Royal Roads University and Dave Buck for an intensive training course. MbMF is supporting the development of the curriculum. In addition, the training course will be piloted in the MbMF area in the autumn of 2009. (*Source*: CMFN News, 27 July 2009.)

Canada to enhance NTFP research and production

The Honourable Denis Lebel, Minister of State for Canada Economic Development, today announced the awarding of CA$49 826 in non-repayable funding to the Syndicat des producteurs de bois de la Mauricie (SPBM) (Mauricie Wood Producers Trade Union) to carry out research aimed at identifying ways to enhance Mauricie NTFPs.

NTFPs are native or naturalized plants other than timber (fibre). They are gathered in the forest, idle land, underbrush, natural forests or managed plantations. The contribution from Canada Economic Development will help generate a databank and set of tools aimed at mapping out effective land development and supply strategies. In addition, the setting up of a network of stakeholders should attract processing firms to the region, while creating sustainable jobs in this sector of activity.

"Wise use of our forest resources is an attractive economic development and diversification opportunity for the region. The SPBM's project will make it possible to develop the NTFP industry in a concerted and coherent manner, so as to maximize the positive economic impacts," said Minister Lebel.

Since 1967, the SPBM has supported the 5 700 or so private woodlot owners in their efforts to harness and market their unique forest products by providing advisory services and training related to forestry operations.

Canada Economic Development's funding of this project has been awarded through the Community Economic Diversification Initiative – Vitality, a measure aimed at supporting slow-growth communities, encouraging diversification of the local economic base and reducing reliance on single-industry economies. (*Source*: Canada News Centre, 21 September 2009.)

CHINA

Medicinal plant fights Chinese desertification, brings profit

Hohhot. When Ulji sold his beloved jeep that he used in herding and spent the money on saplings and herb seeds, his father flew into a rage and shouted at him; "We are herdsmen, herding is what we do".

But Ulji never regretted his actions. In 2001, he put all he had on planting *cistanche* (*Cistanche* spp.), a kind of herb that has a symbiotic relationship with the desert plant, *saxaul* (*Haloxylon ammodendron*).

Saxaul is used effectively to fight against impeding erosion, but without its symbiotic partner *cistanche*, there is no monetary gain in growing it. *Cistanche* lives on the slender tendrils of *saxaul*'s root, and is often called the ginseng of the desert. As a treasured traditional Chinese herb, it has been used to treat senile dementia, constipation and infertility. It is also believed to boost immunity, improve memory and delay ageing.

Ulji began to grow *saxaul* inoculated with *cistanche* in 2003 and harvested the first *cistanche* in 2006. He couldn't wait to show it to his parents, who still had no idea how much money the humble potato-like plant would provide for the family.

In May 2006, Ulji sold half a packet of *cistanche* for 3 000 yuan (US$440), equal to the average annual income per capita in the town. And in the spring of 2008, the family earned more than 10 000 yuan just from *cistanche*.

So far, Ulji has planted *saxaul* on 24 ha of desert and fruit trees on another 21 ha, making a small oasis in the fourth-largest desert in China.

Zhang Jianjun, a 33-year-old vendor in a small town called Bayangaole near the Ulan Buh desert, still remembers how his family had to move five times because of desert expansion a decade ago. The family has not moved since 1999, after Dengkou county, which administers Bayangaole, invested heavily in growing *saxaul*. Now the county has planted 20 000 ha of *saxaul* and inoculated *cistanche* on 2 000 ha.

To combat desertification, *saxaul-cistanche* shrubs are spread over the vast deserts of western China. The shrubs also serve as wind barriers on the singular road that runs through Tarim desert in Xinjiang, northwest China. The *cistanche*-rich barriers generate 9 million yuan revenue a year, enough to cover maintenance of the road.

Saxaul, a small, bushy tree 1–4 m high, has an 80 percent chance of surviving drought and barren deserts. It has a strong root that can reach more than 10 m down into the ground and hold the sands firmly. Its lush needle leaves also slow down the wind. It once faced extinction as herdsmen would overharvest the tree, digging it up by the roots. But the situation started to change once the Chinese began to cultivate *cistanche* artificially.

Every hectare of *saxaul* grown with *cistanche* can yield 150 000 yuan worth of *cistanche* products, in addition to the desertification control benefits, said Tu Pengfei, a scholar from Beijing University's Modern Research Center for Traditional Chinese Medicine. The *cistanche* and *saxaul* combination is an ideal way to combat desertification compared with growing grass and trees, said Tu.

"The locals take more personal initiatives in planting profitable herbs such as *cistanche* to prevent desertification," said Xia Ri, President of the Inner Mongolia Sand and Herbs Industry Association. "And it helps ecology, economy and social well-being," Xia added.

Jia Zhibang, Chief of China Forestry Administration, said 18.11 percent of China, or 174 million ha, is desert. China suffers an annual direct economic loss of 54 billion yuan from desertification that affects the lives of nearly 400 million people.

China's desert area has been shrinking at the rate of 128 300 ha a year, a U-turn from the annual expansion of 343 600 ha before the end of the twentieth century. (*Source*: Xinhua News [China], 27 July 2009.)

COSTA RICA

Semillas Sagradas: an ethnomedicinal garden

Since the beginning of time, humans have depended on seeds for survival. Seeds of many different plant species have provided essentials such as food, fibres, medicines and combustible oils. At some point, people noticed that seeds dropping from the plants they were using had sprouted, quickly multiplying the plant populations.

The development and spread of agriculture are thought to have begun over 10 000 years ago, when people began intentionally to collect and plant seeds of species they considered important. Agricultural practices developed independently in many parts of the world. Human society quickly learned how vital seeds were to feeding, fuelling and healing their rapidly evolving world. In fact, agriculture made it possible for human civilization to develop and for people to move to new regions; build settlements; feed, clothe, house and heal growing populations; store and barter or sell their surpluses.

It was the recognition of the essentiality of crop seeds that led people to create the first seed banks – these precious propagules were originally stored in earthen pots in cool areas underground or in caves protected from the elements. Great advances in seed storage technology have been made since those early days, with large international projects now under way to protect the Earth's plant diversity – sometimes in deep freezers at -20°C. At the same time as the world scientific community, using its latest technological tools, takes on the massive challenge of preserving seeds as a hedge against calamity, it is now clear that small farmers around the world are essential to seed and genetic preservation – by maintaining crop diversity through cultivation and use, and by the protection of nature habitats, including agricultural ecosystems.

Steeped in this spirit and purpose was the creation of Semillas Sagradas – the Sacred Seed Sanctuary of Finca Luna Nueva – devoted to preserving the diversity of plants so important in traditional healing and the field of botanical medicine.

A 2009 publication, *Plants of Semillas Sagradas: an ethnomedicinal garden in Costa Rica* (by Rafael Ocampo and Michael J. Balick), contains information on a small number of the more than 250 plant species currently growing in Semillas Sagradas. The senior author, Rafael Ocampo, selected these species as representative of the range of plants he, Steven Farrell, and the staff of Finca Luna Nueva began to grow in the garden. The book is not intended as a complete guide to Semillas Sagradas, but rather as an illustration of the richness of information that exists about the many species under protection and study there. How fascinating to find that a species of plant is used for the same healing purpose in various parts of the world. One can only imagine the trial and error experimentation that led to those simultaneous discoveries – or did people disperse seeds and plants, along with knowledge of their healing properties, on their journeys? The answer, most likely, is that both scenarios occurred. We know that some plants are employed for the same medicinal uses by cultures that have never been in contact, while we have evidence of other species being dispersed to far-off places by botanically and medicinally inclined travellers and explorers.

Semillas Sagradas is a contribution to preserving and teaching traditional wisdom involving healing herbs. It honours the reverence that ancient cultures had for their seeds and plants, such as the sacred lotus, according them the highest status possible through religious symbolism, myth and legend. The information presented in an earlier version of this document was originally compiled by the senior author. The coauthor and editors expanded that version, updated nomenclature and synonyms, added local names through conversations with the San Isidro de Peñas Blancas community, and collected additional references on uses, chemistry and pharmacology.

It is the hope of the authors that perhaps some readers will find a way to create their own Semillas Sagradas, in Costa Rica or wherever they make their home, contributing both to the preservation of plant diversity and the knowledge of traditional medicines around the world.

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CUBA

Se impulsa el cultivo del bambú en el oriente cubano

La Habana. La provincia de Santiago de Cuba, en la zona oriental de la isla, promueve la siembra de bambú para la

actividad forestal, además de recuperar áreas afectadas por la deforestación. El territorio desea concretar este año la plantación de unas 400 hectáreas de esa especie vegetal.

Los especialistas destacaron la utilidad del bambú por sus variados usos económicos en la confección de muebles y objetos artesanales, muy demandados en el mercado interno. Entre los usos de esa planta resaltan la elaboración de madera prensada, la edificación de casas con distintos fines así como instalaciones para el expendio de alimentos ligeros.

Los bosques son también vitales en los planes para disminuir el impacto del cambio climático, dada su gran capacidad en captar el CO_2 presente en la atmósfera y sanear los terrenos dañados o con escasa vocación forestal. (*Fuente*: DTCuba, 6 de julio de 2009.)

DEMOCRATIC REPUBLIC OF THE CONGO

Atelier pour l'élaboration de la stratégie et du plan d'action national sur la viande de brousse

Un atelier visant à l'élaboration de la stratégie et du plan d'action national sur la viande de brousse s'est tenu du 23 au 24 septembre 2009 à Kinshasa.

Cet atelier était organisé par l'Institut congolais pour la conservation de la nature (ICCN), sous le haut patronage du Ministère de l'environnement, de la conservation de la nature et et du tourisme (MECNT), en collaboration avec le programme TRAFFIC pour l'Afrique centrale, un programme mixte du Fonds mondial pour la nature (WWF) et de l'Union internationale pour la conservation de la nature (UICN). Cet atelier a réuni une cinquantaine de participants, représentant de nombreux groupes ou institutions: administrations nationales coordinations provinciales de l'environnement, conservateurs des sites de l'ICCN (Parcs nationaux de la Maïko, de la Garamba, de la Salonga et de Virungas, Parc marin des mangroves, Réserve de faune d'Okapis), Commission en charge des forêts d'Afrique centrale (COMIFAC), Programme régional de l'Afrique centrale pour l'environnement (CARPE/UICN), Programme sur la biodiversité et et les forêts relevant de la coopération technique allemande, Université de Kisangani, Groupe de travail forêts (GTF), projet de recherche *Lukuru Wildlife Research Project* (LWRP), UICN-RDC, Organisations non gouvernementales (ONG) nationales et internationales (WWF-RDC, African Wildlife Foundation [AWF], Wildlife Conservation Society [WCS], TRAFFIC Afrique Centrale, etc.), presse écrite et audiovisuelle.

Tous ont participé activement à cet atelier de réflexion, dont les objectifs ambitieux étaient les suivants: (i) identification des différents problèmes ou facteurs à la base de la gestion non durable de la faune sauvage en République démocratique du Congo et défis à relever à cet égard; (ii) formulation, à partir des problèmes et défis identifiés, des principaux axes stratégiques susceptibles de permettre la gestion durable de la ressource faunique en République démocratique du Congo; (iii) production, pour chaque axe stratégique, d'un cadre logique qui en définit les objectifs, les résultats attendus, les actions à exécuter, les indicateurs, les sources de vérification, les responsables et les sources de financement.

Dans son allocution de bienvenue, Stéphane Ringuet, Conseiller technique pour le développement du programme TRAFFIC en Afrique Centrale, a rappelé que «TRAFFIC s'associe à cet atelier afin de soutenir un processus d'élaboration d'une stratégie et d'un plan d'action national sur la viande de brousse». Il a d'autre part souligné que «cette stratégie contribuera à orienter et canaliser les efforts futurs de la République démocratique du Congo, en vue de fixer un cadre d'actions/des axes à tous les niveaux du pays.» Ce souhait a été partagé par l'ensemble des participants.

Dans son allocution, le Dr. Petrus Ndongala-Viengele, Directeur de cabinet du Ministère de l'environnement, de la conservation de la nature et du tourisme, représentant le Ministre, s'est félicité de l'appui des partenaires. Il a en outre fait observer que cette stratégie devrait permettre au pays de préserver ce qui peut encore l'être, tout en comptant sur le pouvoir régénérateur de la nature. A cet égard, il a affirmé: «Personnellement, je me suis inquiété quant à l'avenir de nos écosystèmes naturels lorsque j'ai entendu le cri d'alarme faisant mention du 'syndrome des forêts vides', qui devenait malheureusement une réalité pour les forêts de la République démocratique du Congo, et dont les conséquences écologiques pourraient être la diminution ou l'extinction de différentes espèces de faune. Ce serait une catastrophe pour notre pays qui abrite des espèces endémiques, notamment le bonobo, le rhinocéros blanc du nord, etc.». Il apparaissait donc que ce travail de réflexion arrivait à point.

Quant à l'ICCN, organisateur de cet atelier, il s'est exprimé ainsi par la voix de son Directeur général adjoint, M. Idi Omari India: «C'est avec empressement que l'Institut congolais pour la conservation de la nature attend que le processus d'élaboration de la stratégie et du plan d'action sur la viande de brousse, lancé par la tenue de cet atelier, aboutisse le plus rapidement possible.»

Avec l'appui du Dr Guy Mbayma Atalya, Inspecteur général auprès de l'ICCN et modérateur de cet atelier de réflexion, les participants ont pu dégager trois axes majeurs sur lesquels les futurs stratégie et plan d'action devraient s'articuler, à savoir: (i) l'amélioration de l'efficacité du cadre juridique et institutionnel, (ii) l'initiation et la promotion des activités alternatives à la consommation et à la commercialisation de viande de brousse, et (iii) la sensibilisation à cette problématique de la part de l'ensemble des parties prenantes. Les axes relatifs au suivi et aux renforcement des capacités ont été reconnus comme transversaux.
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EQUATORIAL GUINEA

Linkages between household wealth, bushmeat and other animal protein consumption

Bushmeat consumption is affected by household wealth. However, how household wealth impacts bushmeat eaten in different environmental and social settings (i.e. whether urban, rural, coastal or forest) is poorly understood.

In a recent study, the authors examined households in six contrasting localities in Rio Muni, Equatorial Guinea, in coastal (Bata, Cogo), central (Niefang, Evinayong) and eastern parts of the territory (Ebebiyin, Nsork). On average, 32.3 g of bushmeat per adult male equivalent per day were consumed, although this varied widely between sites and most households ate no bushmeat on the survey day. Fish was the most frequently recorded source of protein

and in a coastal site, Cogo, significantly more fish was consumed than in the other localities.

Overall, average protein consumption was correlated with household wealth, but the strength of this effect varied among sites. At the site where average wealth was greatest (Bata, the most urban site), bushmeat was more expensive and wealthier households ate more of it. Elsewhere, bushmeat consumption was not associated with wealth, and the cost of bushmeat was a higher proportion of household wealth. In Bata, wealthier households reported consumption of more than one meat type (most frequently bushmeat and either domestic meat or fish), and diversity of dietary items also increased with wealth. In all sites, wealthier households ate less fish.

The authors demonstrate distinct differences in relationships between urban versus rural areas, and between coastal versus inland sites, and therefore caution that general patterns of wealth-wild meat consumption must be evaluated taking into account the circumstances of wild meat consumers. (*Source:* J.E. Fa, L. Albrechtsen, P.J.Johnson and D.W. Macdonald. 2009. Linkages between household wealth, bushmeat and other animal protein consumption are not invariant: evidence from Rio Muni, Equatorial Guinea. *Animal Conservation*, 12[6]: 599–610.)

FIJI

Fiji's forests as carbon factories

Protecting, growing and managing Fiji's forests will help address environmental challenges such as climate change, says Forestry Ministry permanent secretary Viliame Naupoto. However, the aim was to create a road map that would help manage the forest sector climate change, he said at the REDD (reducing emissions from deforestation and forest degradation) policy scoping workshop.

"It has been known for centuries that forests are factories that provide countless economic, ecosystem and social services. The services include timber, water catchment protection, water production for agriculture, NWFPs, biological diversity, fuelwood and social recreation," Mr Naupoto said. Forests are large storehouses for carbon that is captured from the atmosphere. "We can lock the carbon by forest protection." (*Source*: Fiji Times Online, 31 August 2009.)

GHANA

Promotion of NWFPs may save the forests

Ghana faces the threat of losing its forest cover and becoming a desert if the current rate of deforestation continues without support from all stakeholders in an effort to switch to the use of regenerative and early maturing plant species, Mr Henry Kamel Ford, a deputy minister for the Ministry of Lands and Natural Resources warned on Friday when he interacted with members of the Greater Accra Bamboo and Rattan Association. He said that the Government was exploring ways to conserve the traditional wood species and promote the lesser-used plant varieties such as bamboo and rattan, which have very high regenerative capacities.

In a stocktaking of the forest resources of the nation, Mr Ford pointed out that forest cover, which was about 8.3 million ha in 2000, shrank to 1.5 million ha in 2006. He added that, if the current rate of depletion of 65 000 ha continued, Ghana would have no forests in 23 years' time.

Consequently, the Government of Ghana is promoting the use of bamboo and rattan as suitable alternatives to wood, not only to conserve the traditional woods, but also because bamboo has nutritional values and moreover could be used in the aviation, construction and textile industries. Mr Ford said that the Ministry had begun a capacity programme for stakeholders in the bamboo industry, and was collaborating with the governments of China and the Philippines for training to enhance bamboo use in Ghana.

Mr Ford said the government was ready to support the acquisition of land at Ayimensa, near Accra, to localize the bamboo industry there in order to make it a one-stop shop for bamboo products. Currently, most artisans in the bamboo and rattan industry are scattered throughout Accra without any proper shelter, making it difficult for them to work when it rains.

The deputy minister inspected some furniture made from bamboo and rattan by the artisans and saw how they had recycled the waste materials to mould animals such as giraffes, lions and other forest species. He said it would perhaps become possible for schoolchildren to use bamboo furniture when the industry was fully developed, in order to save the nation's traditional wood species.

Mr Vincent Mawuli Vordzi, General Secretary of the Association, said the main problem facing its 500 members was the acquisition of land. He said the nine plots acquired so far were not large enough to accommodate all the members.

Mr Vordzi called on the government to empower the Association to issue licences for entry into bamboo enclaves for the harvesting of the plant, and also help the Association to check the illegal export of bamboo products while measures were also being taken to expand the market for bamboo products. (*Source*: Ghana News Agency, 2 August 2009.)

Dependence on forest resources and tropical deforestation

In Ghana, forests provide many products on which the local population subsists. However, these resources are becoming depleted as a result of a variety of factors including agricultural expansion and overexploitation of forest resources. It is believed that at the start of the 1900s, one-third of Ghana's land area was covered by natural tropical forest; by 1989, 78 percent of this forest had disappeared.

A recent survey conducted with 431 household heads in three Forest Districts showed that forest income provides 38 percent of total household income in these areas. Household consumption and petty trading in firewood and other NTFPs – such as fodder, building materials, herbal medicines, chewing sticks, pestles, canes, nuts, wild fruits, honey, bushmeat (giant rats, grasscutters and squirrels), artifacts and other household items – are integral to lives and livelihoods. The majority of the respondents surveyed depend on wild animals such as snails and bushmeat, wild honey and wild and cultivated vegetables.

The four most highly ranked causes of deforestation are poverty-driven agriculture, lack of alternative rural wage employment other than farming, household population levels and conflict in traditional land practices. This shows a shift in the view of local people who, in the past, were quick to

blame logging companies and government policies for deforestation. Given the reasons for deforestation, much thought needs to go into agroforestry practices (e.g. snail farming, beekeeping, fish farming and vegetable production) in efforts to reduce deforestation, which are currently less promoted. (*Source*: Mark Appiah, Dominic Blay, Lawrence Damnyag, Francis K. Dwomoh, Ari Pappinen and Olavi Luukkanen. 2009. *Environ. Dev. Sustain.*, 11: 471–487.)

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GUYANA

New tree species discovered in Guyana is rich source of oil

Botanists have discovered a new species of tree with commercial significance in Guyana. The discovery is published in *Brittonia*, a journal issued by the New York Botanical Garden. The new species, *Carapa akuri*, had long been mistaken for *Carapa guianensis*, a tree widely dispersed across the Amazon and commonly logged for the furniture industry.

The find is significant because it is an important source of natural oil for Makushi Amerindians and the cosmetic market, according to Pierre-Michel Forget, lead author of the paper that describes the species and a researcher at the National Natural History Museum in Paris. "*Akuri* is an important source of sustainable development within the Iwokrama forest," Forget told mongabay.com, referring to Guyana's innovative forest reserve that has become the centrepiece for the country's efforts to protect its forests through sustainable management.

Oil from *carapa*'s large seeds is used for a variety of purposes, including treatment for dandruff and rashes, as an insect repellent and as a moisturizer. When produced from *Carapa guianensis*, the oil is known as crabwood oil or *andiroba*.

The species is also endemic to the region and may be at risk from logging, providing new impetus for protecting its diverse rain forest habitat. "This single tree can save a forest," said Forget.

Carapa akuri is named after the red-rumped agouti (*Dasyprocta leporina*), which is probably the main seed disperser of *carapa* in Guyana. The indigenous Makushi name for the agouti is *akuri*.

Coauthors on the paper include Odile Poncy of the Centre national de la recherche scientifique (National Centre of Scientific Research) in Paris, Rachel Thomas of Iwokrama, David Hammond of the NWFS Consultancy and David Kenfack of the Missouri Botanical Garden. (*Source*: mongabay.com, 9 December 2009.)

Iwokrama Forest: conservation with social and economic benefits

The loss of tropical forests will result in the extinction of half the world's plant and animal species, with unknown changes to the global climate. To counter the global loss of tropical forests, the Iwokrama Forest – a protected area in the Guiana Shield of northeastern South America – was established, with the idea of providing a living laboratory for tropical forest management.

Situated at the heart of one of the last four untouched tropical forests in the world, Iwokrama is home to the indigenous Makushi people, who have lived off the forest for generations. The Makushi ways of managing and using the forest have made them a critical part of the ecosystem. Today, the success of the protected area relies on the ownership of local people and the combined skills of specialists and communities.

As a non-profit institution established by Guyana and the Commonwealth, the Iwokrama International Centre for Rain Forest Conservation and Development collaborates with local people to ensure local economic and social benefits from forest use and conservation. By partnering with local communities and the private sector, the Centre combines traditional knowledge, science and business to develop "green", socially responsible and sustainable forest products and services. These include ecotourism, low-impact timber harvesting, developing the skills of forest rangers and guides, and harvesting aquarium fish.

These forest-based businesses, while providing local and national benefits and returns, also help preserve biodiversity and regulate climate. By managing the 371 000 ha of the Iwokrama Forest, the Centre aims to show how conservation need not be at the expense of local livelihoods. On the contrary, forests can be conserved and sustainably used and provide ecological, social and economic benefits to local, national and international communities.

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Norway to help protect Guyana's forests

For the past year, President Bharrat Jagdeo of Guyana has travelled the world, offering to place his nation's forests under international supervision if other countries pay his citizens not to deforest the tropical landscapes. Much of Guyana's forest land is zoned for logging activities, and avoided deforestation schemes in neighbouring Brazil could push logging into Guyana.

The campaign received major support last week when Norway announced a US$30 million commitment on Monday for the small South American nation to implement an "avoided deforestation" plan. If the programme shows success, Guyana will receive an additional US$250 million through 2015.

"We are giving the world a workable model for climate change collaboration between North and South," said Erik Solheim, Norway's Minister of the Environment and International Development, in a statement. "It's not perfect, but it's good, and it will be improved upon as we learn and develop together." (*Source*: ENN Daily Newsletter, 18 November 2009.)

INDIA

Pimpinella tirupatiensis: an endemic medicinal tuber under threat

Pimpinella tirupatiensis is an endemic plant species in the Seshachalam hill ranges of Tirupati-Kadapa-Nallamalai, in the Eastern Ghats of India. Belonging to the Apiaceae (or Umbelliferae) family, the plant is generally found growing at an altitude ranging between 1 080 and 1 240 m. Commonly termed forest coriander in the West, it is known locally in the native Indian Telugu language as *konda kottimeera*. The taxon is characterized by a tuberous root stem (30–100 cm tall) and white flowers that blossom between October and December and bear fruits between February and May.

Pimpinella tirupatiensis grows in association with *Phoenix farnifera* var. *pedunculata* and *Decaschistia crotonifolia*. It sprouts in warm and humid climates and its aroma facilitates insect pollination. The tuberous root contains starch, carbohydrates and proteins, as well as oil globules, phenols, flavanoids, lignins, alkaloids, tannins, steroids and saponins. It is also rich in magnesium (52 percent), with traces of iron, zinc and copper.

The plant plays an important role in health care in the region, boasting several medicinal properties. It is used by locals to combat ulcers and asthma and is also known for its anti-inflammatory qualities as well as for being an aphrodisiac. Locals use the tuberous root extract in powder form, mixing it with honey to cure stomach, mouth and throat ulcers. Its fruits have diuretic properties, also helpful in treating ulcers. In raw form, the tuber is an abortifacient. It is not only valuable for curing human ailments, but those of animals as well. Mixed with pepper and onion, the tuber is given orally to oxen and buffaloes to alleviate colic pains and rheumatic diseases.

However, the species previously known in the Tirumala hills as the "queen of tuberous vegetation" now faces a real threat of extinction. As a result of the changes in microclimatic conditions, natural calamities, the introduction of monoculture practices and the short window of time in which the plant matures, the plant's distribution today is limited to small populations in a handful of rich moist deciduous and mixed dense forests. Its medicinal and economic value, moreover, has led to overexploitation by local tribes and villagers, which may be the greatest threat to the plant's survival. Identifying an alternative medicinal herb with similar properties is crucial to counter the risk of extinction currently facing the plant. (*Contributed by*: Prof. N. Savithramma, Department of Botany, S.V. University, Tirupati – 517 502, Andhra Pradesh, India. E-mail: prof.savithri@yahoo.in)

Bamboo shoot raises hope for sweet profit

The pungent bamboo shoot should soon become a staple ingredient for industrial growth in the underdeveloped Bodo belt. Used to season numerous dishes, the shoot has found its way on to supermarket racks in both fresh and canned versions. Despite its popularity in the northeast, the bamboo shoot has not been tapped for its commercial potential.

Bearing this in mind, the Bodoland Bamboo Development Board and the International Network for Bamboo and Rattan (INBAR), based in Beijing, signed a memorandum of understanding (MoU) to establish a bamboo-shoot processing centre in Kokrajhar on Friday, in an attempt to use the abundant grass on a commercial scale. The bamboo processing centre will be established at the Central Institute of Technology (CIT) situated at Balajan in Kokrajhar. INBAR will lend the technical support required.

Besides training youth, INBAR will emphasize the commercialization of bamboo-related edible products.

Terming the signing of the MoU as a step forward for industrial development in the Bodoland Territorial Council (BTC) area, BTC executive member Mitaram Basumatary, who is also the chairperson of the Bodoland Bamboo Development Board, said all parts of bamboo plants are useful and can be industrially processed and utilized.

"The bamboo shoot has the largest potential market, not only in the region but also outside, but it lacks commercialization and value addition. I believe the proposed bamboo-shoot processing centre will be able to bring some dramatic changes in the bamboo sector in the BTC area. The emphasis is on commercialization of bamboo-related spices and the preservation of bamboo shoots through various technologies," Basumatary said.

Experts say there is a growing market for processed and packaged shoots, providing an opportunity for entrepreneurs to explore their commercial potential. (*Source: The Telegraph* [India], 30 July 2009.)

INDONESIA

Harapan rain forest raises hope amid overexploitation

Sumatra's low-plain forests are fast diminishing, currently measuring only 400 000 ha. The main cause of the deforestation is rampant illegal logging and clear-cutting. If this situation prevails, experts warn, low-plain forests in Sumatra will probably be completely wiped out by 2010.

The Harapan rain forest, spanning 101 355 ha and located in Jambi and south Sumatra provinces, is part of the remaining low-plain forests on the island. It straddles the four regencies of Batanghari, Muarojambi and Sarolangun in Jambi, and Musi Banyuasin in south Sumatra. The area is currently being reforested to replenish the damaged forests, formerly a timber concession. "We're currently repairing the damaged ecosystem," said Harapan rain forest agency intern head Yusuf Cahyadin recently.

As part of the reforestation efforts, the agency will issue an outright cessation on logging in the area, or at least a 20-year moratorium. This, Yusuf said, will allow the forest to be densely wooded once again.

The ban will not affect local communities that live off the forest, particularly the Anak Dalam and Bathin IX tribes, which use NTFPs such as rattan and resin. Communities living near the forest will also stand to benefit, Yusuf says, by growing rubber, for instance. "We're currently initiating a community-based forest through an agreement between forest caretakers and local residents, in the hopes that they can also protect the forest," he said. He added that 30 percent of the forest has been damaged through clear-cutting, particularly for oil-palm plantations. "Oil-palms are not suited to the forest," he pointed out. (*Source: The Jakarta Post* [Indonesia], 25 September 2009.)

ISLAMIC REPUBLIC OF IRAN

Iran's forests and their NWFPs

With an area of about 12.4 million ha, forests in the Islamic Republic of Iran comprise 7.4 percent of the whole country. Recently, the per capita forest area was equal to one-third of the world's per capita average (0.2 ha as compared with 0.6 ha). Although Iran's forest cover is considered poor in comparison with other countries, it is unique regarding plant diversity. The country's climatic diversity has resulted in five distinct forest zones: Hyrcanian, Arasbaran, Zagros, Irano-Turanian and Khalijo-Omanian.

The **Hyrcanian** forest zone encompasses commercial and industrial humid forests, the dominant species of which are beech (*Fagus orientalis*), hornbeam (*Carpinus betulus*), oak (*Quercus macranthera*), poplar (*Populus caspica*), boxtree (*Buxus hyrcanum*) and Caucasian wingnut (*Pterocarya fraxinifolia*). Beech and hornbeam species comprise 70 and 60 percent respectively of the stem number and standing volume. Only in these forests

is industrial timber harvested by governmental sources, cooperatives and private companies. NWFPs are not given much consideration. Currently, NWFPs harvested from the commercial forests are sloe (*Prunus divaricata*) fruits, walnuts (*Juglans regia*), raspberries (*Rubus* sp.), hawthorn (*Crataegus* sp.) and honey. Tourism has increased as a result of the high potential of the region for attracting tourists, expanding facilities and the creation of tourist towns. This industry plays an important role in the local and national economy.

The **Arasbaran** forest zone, with semi-humid forests, has been identified as a global biosphere reserve because of its plant diversity. The most important woody plants in this region are black oak (*Quercus macranthera*), white oak (*Q. petraea*), wig tree (*Cotinus coggygria*), pliant tree (*Viburnum lantana*), cornelian cherry (*Cornus mas*) and juniper (*Juniperus foetidissima*). This is a conservation/protected zone and wood is not harvested either industrially or commercially. Local people in the region use NWFPs such as raspberries, cornelian cherries, hazelnuts, tree leaves, honey, bushmeat and acorns. They also harvest fuelwood extensively. Most products are traditionally harvested without any management plan for their utilization. Some products, such as raspberries, cornelian cherries and honey, can increase household incomes through proper harvesting, processing and marketing.

The **Zagros** forest zone, with semi-arid to temperate dry forests, has three oak species: Lebanon oak (*Quercus libani*), Lusitanian oak (*Q. infectoria*) and Brant's oak (*Q. brantii*). This is also a conservation/protected area and wood is not harvested either industrially or commercially. The high population density and many socio-economic problems have led to an extensive use of NWFPs by the local people. The main product used is fuelwood. Minor products include fruit (*Quercus libani*), leaves (*Q. brantii*) and types of gall such as *qolqaf, mazuj* and *sechka* (*Q. infectoria*). Gramineous flour – a kind of manna – is produced as a result of insect activity on a tannic tree (*Q. infectoria*). This product is used in pastry and has a good market. Fruits and leaves of the oak species are used in animal husbandry and for animal nutrition. Wild pistachio (*Pistacia atlantica*) is one of the most useful forest plants of the Zagros region; the most important product of this species is turpentine. Turpentine is exported and, according to last data from the Forest, Range and Watershed Management Organization of Iran, its export value was US$60 000 in 2000. Other products used in this region are mountain almonds (*Amygdalus* sp.), *zedu* (*A. communis*, *Amygdalus* sp.), wild pears (*Pyrus glabra*), walnuts (*Juglans regia*), myrtle (*Myrtus communis*) and *somaq* (*Rhus coriaria*).

The **Irano-Turanian** forest zone has arid forests with juniper (*Juniperus polycarpus*), wild pistachio (*Pistacia mutica*) and almond (*Amygdalus lycioides*). In this region, as in the other forest zones, wood is not harvested at all. Local people use *zedu* (mountain almond) and turpentine.

The **Khalijo-Omanian** forest zone, consisting of arid tropical forests, has a different appearance from the others. The main species of this territory are mangrove (*Rhizophora mucronata*), black mangrove (*Avicennia marina*), Arabian jujube (*Ziziphus spina-christi*), Indian mesquite (*Prosopis spicigera*) and acacia (*Acacia nilotica*). On the whole, both wood and NWFPs are rarely harvested.

All the forest zones, except the Hyrcanian, are conservation/protected areas and it is probable that the harvest of timber will not be allowed legally – or is ecologically feasible – in the near future. Therefore, the harvesting of NWFPs could play an important role in household economy. This role could be optimized through the use of operating plans; determining sustainable harvest levels; identifying usable species in all forest areas; improving harvesting methods; post-harvesting technologies; increasing participation of local communities; and marketing. Therefore, research into NWFPs needs to explore the role of harvesting, processing and marketing of NWFPs in increasing household income.

Rhus coriaria

The Islamic Republic of Iran has a high potential for tourism and agroforestry, both of which could increase the employment and income of the local people. The vast deserts of the Irano-Turanian zone have abundant attractions – signs of indigenous knowledge (nomads, aqueducts) and also geological facies (salt pans and polygon facies) – which could be promoted for tourism.

Important factors such as population growth, immigration, urbanization and the progress of technology, knowledge and awareness have effectively contributed to management patterns and changing management methods, and the conservation and utilization of forests. These factors mean that we expect more from forests than in the past. In recent decades, policies and strategies based on the conditions and needs of this sector have been recommended in order to help policy-makers and researchers to facilitate sustainable forest management (SFM). Governments must consider supporting SFM and policy-makers should actively engage the participation of rural communities in the exploitation and management of natural resources. Policies should be towards supporting small and medium forest industries. Facilitating the access of small producing factories to markets will improve the livelihoods of people who use forests and trees. Research and correct and valid information about NWFPs are extremely important for policy-makers. The demand for NWFPs will increase as a result of their role in rural development and in improving household economy. Two important and strategic approaches are recommended: the use of criteria and indicators for SFM, introduced in previous international forest processes; and adopting a so-called ecosystem approach in forest management for sustainable forestry activities.

The principles of SFM should be taken into account for forest products (both wood and NWFPs) so that we can be a model for future generations when using our natural heritage. (*Contributed by*: Sajad Ghanbari, M.Sc. student of Forestry, Department of Forestry and Forest Economics, Faculty of Natural Resources, Tehran University, Karaj 31585-4314, Islamic Republic of Iran. Fax: 00982612249312; e-mail: ghanbarisajad@gmail.com)

JAMAICA

University improving life in the Cockpit Country

The Cockpit Country, an area of forested hills that covers parts of St James, Trelawny and St Elizabeth, is highly treasured by scientists because of the vast number of plants and animals found only in that region. These plants and animals also provide food and livelihood for many of the surrounding communities.

The forests contain medicinal plants that are used in home remedies and as key ingredients in wines, "root" drinks and tonics. Among these forest plants are chainy root, *sarsaparilla, medina* and "strong back".

Over the years, however, the Cockpit Country has been heavily harvested for various NTFPs such as roots, bark, vines, leaves and fruits. Medicinal plants are now reported to be in short supply or available only deep in the interior.

With funding from the United States Agency for International Development (USAID) in collaboration with government and local committees, a project led by Dr Sylvia Mitchell, lecturer and head of the Medicinal Plant Research Group at the Biotechnology Centre, University of the West Indies (UWI), Mona, was launched for the micropropagation of selected non-timber forest medicinal plants.

The researchers, realizing that there is an urgent need to curtail the threat to NTFPs, have begun educating residents about how they can earn a living in a manner that does not degrade the forests. Dr Mitchell said that an important component of the education process is showing the residents how to incorporate new technology into their traditional livelihood practices.

She says: "The process starts in the laboratory where the hard-to-find forest plants are multiplied by a process called micropropagation. The rooted plantlets are then taken to the tree-hardening facilities established in the Cockpit Country at Quick Step, Troy and Bunker's Hill. At these demonstration sites, the plantlets are removed from their glass vessels and after a hardening phase, when they are strong enough, they are planted in the field plots".

Dr Mitchell noted that the Cockpit Country's endangered species, particularly these valuable medicinal plants, are now being preserved from overharvesting. In addition, large numbers of plantlets of economically important crops such as wicker, peppers, peppermint, ginger and pineapples are also distributed free of charge to participating community members on the basis that they will collect growth data for the project.

The UWI has created a new opportunity for every rural person in Jamaica to farm and earn a living by using these disease-free plantlets to produce a more bountiful harvest. (*Source*: The Gleaner [Jamaica], 26 July 2009.)

KENYA

The livelihood potential of NWFPs: the case of Mbooni division in Makueni district

Forestry is a productive sector with significant effects on meeting national socio-economic and environmental functions as well as the improvement of rural livelihoods. NWFPs in particular have been widely advocated by conservation and development organizations as potential alternative livelihood strategies, particularly among vulnerable forest-dependent households.

As in most tropical countries, NWFPs are relevant in the sustainable development of Kenya, which is particularly endowed with important forest resources. Kenya hosts about 17 million ha of forested land (about 3.51 percent of the total sub-Saharan Africa forest cover by 2000), of which about 16 865 000 ha are under natural forest. Outside the gazetted forests, there are other large tracts of forests in trust lands, including national parks and reserves, hill forest reserves and privately owned lands covering about 0.5 million ha. Woodlands, bushlands and wooded grasslands, mainly found in the arid and semi-arid lands, cover 37.6 million ha, while forest plantations (started in 1946) cover about 170 000 ha of land.

In most NWFP-endowed regions of the country, however, this socio-economic and environmental potential is still unrealized. The authors of a recent paper illustrate the latter by a case study of NWFP use and management in four villages in the Mbooni division of Makueni district. The division was chosen because of its relatively high NWFP availability, particularly from South Mbooni Forest, which is located at a distance of less than 5 km for an estimated 80 percent of the interviewed households. Data used for the analysis were collected through a fieldwork survey carried out on women (35+ years) in August 2005. One hundred and sixty NWFPs are harvested (from plant and animal species) and used mainly for food, income generation (supplemental) and medicinal purposes.

A number of challenges limit women's enjoyment of the full benefits from NWFP exploitation, the overriding problem being their inadequacy (in quantity and/or quality). In this paper the authors discuss these commonly utilized and managed NWFP plant species in Mbooni and their potential contribution to improved livelihoods and sustainable development in Mbooni, Kenya and sub-Saharan Africa in general. (*Source*: Dorcas Mbuvi and Emmanuel Boon. 2009. The livelihood potential of non-wood forest products: the case of Mbooni Division in Makueni District, Kenya. *Environment, development and sustainability*, 11[5]: 989–1004.)

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MADAGASCAR

Lemurs in danger from political turmoil and "timber mafia"

The lemur, a furry primate that symbolizes Madagascar's unique biodiversity, is under renewed threat from a "timber mafia" pillaging the island's forests for profit. Environmentalists warn that a political crisis in the impoverished country is reversing conservation gains of recent years and putting "hundreds if not thousands" of species, many not yet identified, at risk of extinction. Madagascar, which has been isolated from land masses for more than 160 million years, is the world's fourth largest island and a "conservation hotspot" with thousands of exotic species found only here. These include nearly 100 species of lemur, six of which are deemed critically endangered.

Decades of logging, mining and slash-and-burn farming have destroyed 90 percent of Madagascar's forests, although the rate has slowed in the past two decades. The former president, Marc Ravalomanana, was praised for putting 6 million ha under protection and backing ecofriendly community projects and sustainable farming. But Ravalomanana was ousted in March in a violent coup that led to a breakdown of law and order and a "gold rush" of armed loggers and poachers. International sanctions have caused the suspension of environmental

programmes and could hit 45 national parks that are 90 percent dependent on overseas aid.

The natural habitat of the lemurs is under threat from accelerating deforestation. In addition, the endangered animals are being hunted for bushmeat, either to be eaten by drought-afflicted local populations or sold as a roasted delicacy in city restaurants.

Dr Hantanirina Rasamimanana, a researcher and teacher at Antananarivo University, said: "Deforestation is always a problem, but in these past five months bushmeat is also very dangerous. People are desperate because of the lack of rain". Conservationists say that armed gangs are exploiting the security vacuum to pillage rosewood and ebony from supposedly protected forests on behalf of a so-called "timber mafia".

About half of Madagascar's national budget, and 70 percent of investment spending, comes from outside assistance. But, after the coup, most international donors and lending agencies suspended or cancelled non-humanitarian assistance until a constitutional government is elected. WWF has been forced to suspend several projects. Niall O'Connor, head of WWF's Indian Ocean regional office, said: "The impact of not having funding is probably greater than the political crisis. You start to lose the confidence of the communities. If the World Bank doesn't fund Madagascar national parks, they will run out of money very quickly".

Madagascar's US$390 million (£230 million) a year tourism industry, of which ecotourism is the backbone, is down to just 40 percent of its normal level because of this year's instability.

O'Connor warned that Madagascar's priceless natural laboratory was in jeopardy. "We have the potential for losing hundreds if not thousands of species. There are still new species being discovered: plants, birds, chameleons, lemurs, tortoises that we might not yet know about, that could be on the brink of extinction." (*Source*: iplextra.com [India], 17 November 2009.)

BUSHMEAT TRADE THREATENS RARE LEMURS IN MADAGASCAR

Endangered lemur species found only in Madagascar are being slaughtered and served up in local restaurants as poachers take advantage of a security vacuum on the island after a coup earlier this year.

Pictures of the blackened remains of scores of crowned lemurs and golden-crowned *sifakas*, smoked in preparation for transport, have been released by the environmental protection group Conservation International. James Mackinnon, technical director at the group's Madagascar office, said gangs were pillaging the forests of precious hardwoods and trapping rare animals for Asia's pet market, unwinding hard-fought conservation gains on the island. "Lemurs have always been hunted on a small, subsistence scale. This is bigger, more organized and systematic and it's typical of what we've been seeing with the breakdown in law and order," he told Reuters on Friday.

Poachers are using slingshots and traps to hunt the lemurs in Daraina, a newly protected region in the far north of Madagascar. Only 8 000 golden-crowned *sifakas*, found only in Daraina, remain in the wild and risk being wiped out in weeks. "More than anything else, these poachers are killing the goose that laid the golden egg," said Russ Mittermeier, president of Conservation International. "(They are) wiping out the very animals that people most want to see and undercutting the country and especially local communities by robbing them of future ecotourism revenue." (*Source*: Reuters [India], 21 August 2009.)

MALAYSIA

Malaysia discovers huge potential in oil plants

The Sarawak Biodiversity Centre (SBC) has identified oil plants that have antimicrobial properties which can be exploited for commercial value. State Secretary Datuk Mohamad Morshidi Abdul Ghani added that these plants could be developed as health care products, and used to make hand wash, body shampoo and soap. "With such potential, our communities can benefit economically by carrying out contract farming of these plants," he said, when opening a regional workshop hosted by the Centre yesterday.

The SBC has been nominated by the United Nations Development Programme, which coordinates the distribution of the global environmental fund, as the Asia-Pacific region's centre of excellence for traditional knowledge documentation.

Morshidi said the SBC was carrying out research and development activities on plants documented from the state's indigenous communities. He said the traditional knowledge documentation project had covered 12 indigenous communities in 40 locations statewide over the past seven years.

The state has some 30 indigenous communities spread across 3 000 villages. "From these locations, we have documented over 2 400 plants with various uses: from plants to cure ailments to plants used for crafts. Traditional knowledge has contributed significantly to modern agricultural practices as well as to the personal care, medicinal and cosmetic industries," he said, adding that many products in the market were produced based on information derived from traditional knowledge. Morshidi said if such knowledge was not documented, it risked being "lost". (*Source*: the star online [Malaysia], 9 October 2009.)

MONGOLIA

Marketing the *taiga*: political ecology of NWFPs in Mongolia

Since Mongolia's socio-economic transition and integration into the global market economy, increasing degradation of its natural environment and ongoing loss of biodiversity are taking place. Nowadays, an impoverished and marginalized rural population relies more and more on the commercialization of NWFPs, such as wildlife products or Siberian pine nuts, to sustain their livelihoods. The present situation resembles that at the beginning of the twentieth century, when Mongolia, for the first time, was driven into the world economy as a supplier of natural resources.

Following the conceptual framework of political ecology, a recent article analyses present and past utilization of NWFPs in Mongolia against its sociopolitical, economic and institutional background. The problems of transition can be illustrated with the case study of the Batshireet district on the border

with the Russian Federation: the decline of a sawmill forced people to look for alternative incomes; field studies in 2003 revealed that NWFPs counted for one-third of household incomes. (*Source*: Jurgen Hartwig. 2008. Marketing the *taiga* – political ecology of non-wood forest products in Mongolia. [Original title: Die Vermarktung der Taiga. Zur politischen Okologie der Nutzung von Nicht-Holz-Wald-produkten in der Mongolei.] *Geographische Rundschau*, 60[12]: 18–25. December.)

NEPAL

Herb farming shows way out of poverty

Jumla. The populations of ten Village Development Committees (VDCs) (local communities of villages) in a mid-western district of Nepal have taken to herb farming in a big way. This endeavour, which enjoys the support of the Ministry of Forests and Soil Conservation (MoFSC), is helping to bail people out of penury. Moreover, commercial herb farming has helped conserve medicinal plants that were endangered in the wild as a result of the unabated collection that took place up until 2005.

Medicinal plants are in high demand in the international market and fetch a good price too, says Laxmi Chandra Mahat, district project facilitator for the herb farming project. "Apart from herb conservation, this project will be instrumental in raising the living standard of local people," says Mahat.

According to statistics of the district project office, farmers have cultivated at least ten kinds of herbs in some 1 500 ha in Jumla. "Cultivating crops, we used to find it hard to meet day-to-day expenses even for six months. Now that we have taken to herb farming, we hope to get a better return," says Kali Bahadur Thapa of Patmara VDC.

In the fiscal year 2008/09, the people of Patmara sold 120 kg of herbs and earned about NPR130 000. The profit motivated them and they planted herbs in some 300 ha in their village.

Taking a leaf from Jumla, the MoFSC plans to expand the herb farming project in 11 districts of four zones in three phases by 2014. The International Fund for Agricultural Development has loaned NPR1.5 billion to the ministry for the NPR2.17-billion project, according to Mahat. (*Source*: Ekantipur.com [Nepal], 2 August 2009.)

PERU

Peru to pay Indians for conservation of Amazon jungle

Lima. The Peruvian Government will pay Indian communities for their work in preserving the Amazon jungle as part of an ambitious programme that seeks to protect 55 million ha of rain forest in the country, Environment Minister Antonio Brack told EFE (Spanish news agency).

"One of the worst problems about global warming is that mankind in the last 500 years has destroyed 50 percent of the forests on the planet and that is a very serious problem indeed," the Minister said, adding that in Peru 10 million ha of tropical forest have been destroyed. Up to now development has consisted of the woodland practice of slash-and-burn to clear land for crops and livestock, but that has given mediocre results because of the 10 million ha where that has been carried out, 8 million ha are unproductive. "It's shameful and we can't keep doing it," Brack said.

The Peruvian administration's programme is not limited to compensating native communities economically, but will also initiate other actions such as employing 600 Indians as forest rangers to protect these areas, and to award scholarships so that natives can be trained in activities such as ecotourism and beekeeping. (*Source*: Latin American Herald Tribune, 9 August 2009.)

PHILIPPINES

Plans to raise awareness of medicinal plants

The Philippines should undertake initiatives to conserve native medicinal plants amid the increasing global trade in herbals now estimated at US$120 billion. In a statement released by the Philippine Exporters Confederation Inc., BiomartAsia-Philippines noted that the increasing demand for local medicinal plants could result in overharvesting.

"Recognizing that our medicinal plants are so important, we must protect them, especially the endemic plants. The commercial demand for local medicinal plants may cause overharvesting from the wild," said Gina Mangalindan of BiomartAsia-Philippines. Biomart, a firm specializing in herbal skin care products, makes use of locally grown natural herbs known for their unique properties.

Mangalindan said that the creation of a Medicinal Plant Working Group, which may include representatives from industry, government, academia, tribes and environmental organizations, is needed. Its goal should be to create a framework action on behalf of medicinal plants. She said the group must raise awareness of native medicinal plant issues and needs among partner agencies and cooperating organizations also to promote the sustainable production of native medicinal plant products.

Mangalindan said that those who want to go into the medicinal plant industry could also take note of a number of trends that include the rising demand for certified "organic" raw material and value-added products such as teas, soaps, juices, cosmetics and extracts. "The health food sector is also increasing, so natural alternatives to artificial flavours, sugar and salt are being looked at," she said.

Mangalindan said the global herbal market comprises pharmaceuticals, spices and herbs and cosmetics. The global market today is mainly divided among Germany (28 percent), Asia (19 percent), Japan (17 percent), France (13 percent), rest of Europe (12 percent) and North America (11 percent). The major suppliers of crude medicinal products to European markets are China, the United States of America, Germany, Singapore, India, Chile, Egypt, Albania, Bulgaria, Morocco, Mexico and Pakistan. (*Source*: Business Mirror [Philippines], 7 September 2009.)

Sustaining traditions to safeguard the future of forests in the southern Philippines

In the small community of Mintapod, nestled on the slopes of Kimangkil Mountain Range in Bukidnon province, Mindanao, live the Higaonon Indigenous Peoples, whose lives and livelihoods have long depended on the natural resources in their mountain habitat. Their time-

honoured knowledge and traditions play a central role in protecting the local forests. Earlier this year, five Higaonon ancestral domains, represented by their traditional leaders called *datu*, signed the Mintapod Declaration. The agreement represents over 5 000 Higaonon families and aims to protect the health of the local mountains.

The Declaration was the highlight of the Kimangkil Indigenous Peoples Corridor Conference held at Cagayan de Oro City from 1 to 3 April 2009, which attracted over 80 participants from Higaonon indigenous communities, support groups and government institutions. The Conference is part of a larger project called "Building Forest Corridors through Sustainable Ancestral Domain Management", supported by the European Commission. The initiative aims to contribute to forest conservation by strengthening indigenous peoples' communities. Crucial community needs – such as tenure security and skills building in legal affairs, livelihood enterprise, reforestation and sustainable forest management – are addressed through the project.

The leader of the initiative, Amy Matangkilan, emphasized that recognizing the Higaonon Peoples' right to continue practising their traditional skills will help preserve over 70 percent of the local forests. (*Source: Voices from the forest*, NTFP Exchange Programme for South and Southeast Asia, Edition No. 17, September 2009.)

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POLAND

Honey – again – grows on trees

Spala. Perched in a lofty pine tree 12 m from the forest floor, Tomasz Dzierzanowski carefully removed a clump of dry grass from a hole in the wood and wafted smoke into a bees' nest. Using a wooden spatula, he delicately cut out the gleaming slices of honeycomb, and the dark, shining liquid ran down his fingers. After climbing down, he tore off a waxy chunk and tasted the powerfully flavoured honey.

Dzierzanowski is one of a group of Polish enthusiasts reviving a form of beekeeping stretching back thousands of years but abandoned more than a century ago. "There used to be thousands of bees' nests in Poland's forests, tens of thousands even," Dzierzanowski told AFP (Agence France-Presse) in the Spala forest, about 100 km south of the capital, Warsaw.

"For now, we've set up around 20," added Dzierzanowski, whose day job is with the local environmental department.

After initially collecting honey from purely wild bees' nests, ancient hunter-gatherers gradually learned how to give the insects a helping hand by cutting holes in trees and leaving honeycomb to attract a swarm. Under that ancestral method, the subsequent nest was opened just twice a year: once in the spring to check how well the bees had survived the winter, and again in the autumn to harvest the honey.

The practice persisted in Poland until the end of the nineteenth century, gradually losing ground because honey from the growing number of beehive farms was cheaper and the forests were hit by large-scale felling. A natural mishap in the 1980s wiped out the remaining wild bees buzzing around Poland's forests – a disease of Asian origin carried by a parasitic mite called *Varroa destructor*.

The current revival then is also a total reintroduction of the insect after a three-decade absence. It comes thanks to a meeting of minds between the global environmental group WWF, two Polish national parks, enthusiasts such as Dzierzanowski, and a group of beekeepers from Bashkortostan, a region of the Russian Federation near the Ural Mountains.

"We discovered that they still harvested honey from trees in Bashkortostan," said Przemyslaw Nawrocki, who is in charge of the project at WWF. "We got in touch with the Bashkir beekeepers who hosted us there and patiently taught us their craft. Last year, they came to Poland to set up the first hives," he added. The Poles also spent their time trawling through museums to learn about the ancient method, making precision copies of the tools of their ancestors.

"According to the archives, they used to harvest between 6–10 kg of honey per tree. Our maximum is around 3 kg. But it's only our second year of harvesting, so we need to wait a while longer," said Dzierzanowski.

Tree honey is distinctive – Dzierzanowski's harvest had a deep-gold colour, an initial

smoky taste and was not oversweet – and is traditionally eaten mixed with remainders of pollen and chewy wax. "Forest honey is much better than other kinds because it contains seven times more micronutrients," said Nawrocki.

In addition, it is a delight for organic food fans: the forest nests and the bees' pollen-gathering territory lie far from the fertilizer- and pesticide-strewn fields of agribusiness. Besides tickling the palate, bringing back honey harvesting has a broader ecological goal.

"In the past, bees were an integral part of the forests, and played a role in their biodiversity," Nawrocki explained.

While the amount of honey harvested is still tiny, the enthusiasts dream of a day when there will be thousands of such nests across the country. Another long-term goal is to get Polish tree honey inscribed in a European Union register of produce that is rooted in specific regions of the 27-nation bloc. (*Source*: Agence France-Presse, 3 October 2009.)

RWANDA

Farmers to benefit from bamboo fraternity

Kigali. Rwandan farmers have been fronted as a priority group to benefit from a bamboo planting fraternity spearheaded by the International Network for Bamboo and Rattan (INBAR). This was revealed early last week by the visiting INBAR Director General, J. Coosje Hoogendoorn, who said that Rwanda has all it takes to gain from the immense environmental and economic benefits of bamboo trees. "I am struck by the tremendous potential in this country. The soil and weather are favourable for the growth of bamboo trees and I am impressed that people here have realized the importance of bamboo," Hoogendoorn said.

Bamboo is one of the most productive and fastest growing plants on Earth and it

offers the possibility of annual selective harvesting and removal of about 15–20 percent of the total stock productivity. Over 90 percent of bamboo carbon can be sequestered in durable products such as boards, floors, furniture, buildings, cloth, paper and charcoal.

Bamboo trees play an important role in controlling soil erosion, which is one of the most outstanding problems faced by farmers in Rwanda. According to Hoogendoorn, INBAR is partnering with China to provide the capacity for bamboo processing. She said INBAR is looking at conserving the already existing bamboo trees as well as introducing new species. INBAR has a membership of 34 countries and Rwanda is its current chair.

Fredrick Munyansonga, the official charged with bamboo planting in the forestry department, revealed that this partnership is likely to change the lives of many people, especially farmers. "Bamboo planting has two inherently important causes, conserving the soil and alleviating poverty. This cause should be taken seriously because it's a total win-win undertaking," he said.

Around 1.5 billion people around the world depend on bamboo in some way. (*Source: The New Times* [Kigali], 23 August 2009.)

UGANDA

Communities establish forest enterprises while protecting their local habitat

Local communities in Uganda have long depended on forest resources in the Bwindi Impenetrable National Park for weaving materials, medicinal plants, hunting, honey collection, fruit gathering and building poles. In 2001, FAO began assisting local men and women to develop small forest enterprises, making sure not to interfere with the park's conservation efforts.

With the help of FAO, nearly 200 women and over 100 men were assisted in establishing small-scale enterprises on the outskirts of the park. These activities are managed entirely by local men and women and consist of beekeeping; handicrafts; mushroom, passion fruit and potato cultivation; and ecotours. The Buhoma village walk was one of the first successful ecotourism enterprises established; tourists are guided through the park for gorilla watching, with the tour stopping at a local handicrafts centre run by women.

Between January 2003 and August 2005, 2 295 tourists took part in this enterprise. In addition, locals' access to credit has also been facilitated and community camp grounds improved.

This initiative is an example of how measures to protect and conserve forests can work in tandem with those aiming to alleviate poverty. (*Source: Bridging the gap*. 2009. FAO's Programme for Gender Equality in Agriculture and Rural Development.)

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Turning honey into money

Beekeeping is a venture that has not attracted many investors. However, the demand for this product locally and internationally explains the dire need for more investors to engage in its production.

Dickson Biryomumaisho, Director, Western Region, the Uganda National Apiculture Development Organization (TUNADO), describes apiculture as the science of bees and art of keeping bees to produce honey and other hive products, using different techniques. This art can be carried out with or without land. "One may need as little as10 x 10 m of land, unlike other ventures," he says, adding that the undertaking is a low-cost investment open to all classes of people since little or no capital is needed. "Hives and other equipment can be made locally and bees are freely available and depend on beekeepers for food," he says.

Traditional hives include broken pots, woven twig hives or log hives that are hung on trees. However, Biryomumaisho says that it is advisable for bee farmers to graduate to modern Langsroth hives where, unlike traditional hives where honey is extracted naturally, a honey extractor is needed to harvest honey. Top bar hives are referred to as transitional hives since they bridge traditional bee farming with Langsroth bee farming. Langsroth hives are reusable, which could lead to an increase in honey production.

Traditional hives yield between 8 to 15 kg per harvest whereas 20 to 30 kg can be harvested from the modern Langstroth.

Since a great deal of expertise is not required, beekeeping can be practised by all – the educated and the uneducated – and irrespective of age, gender and economic status. Any entrepreneur would be suited and beekeeping could be a source of employment for many.

In areas where beekeeping is predominant, people generate income by making beekeeping equipment; processing, packaging and selling bee products; and extension work. Traditional hives sell at between 10 000 to 20 000 shillings (UGX), the top bar hive from UGX40 000 to 55 000, while the Langsroth sells from UGX100 000 to 150 000. A beehive maker can therefore earn a reasonable income. Farmers today sell 1 kg of honey at UGX6 000 to 10 000.

Beekeeping enhances biodiversity and increases crop yields through pollination of crops. The busy bees also contribute to natural resource conservation. This renders beekeeping a non-destructive and sustainable activity.

Biryomumaisho adds that beekeeping can be used as a tool to reduce threats to Uganda's vegetation, particularly natural habitats. "(For instance) national parks, forests and woodlands are an alternative source of livelihood to communities," he says. (*Source*: Daily Monitor [Uganda], 8 October 2009.)

FOR MORE INFORMATION, PLEASE SEE: www.greenresources.no

UNITED STATES OF AMERICA

Chestnut tree restoration

A tree orchard recently set up at the Tennessee Army National Guard Lavinia training site will examine the American chestnut tree, which was decimated by a fungus that arrived more than 100 years ago.

The Tennessee National Guard is working on a programme with the American Chestnut Foundation, which began the restoration project more than 20

years ago. The fast-growing trees were valued for their integral roles in the ecosystem, as food sources and as a lumber source for furniture.

Today, more than 500 chestnuts at the Volunteer Training Site Milan orchard are being tested for ways to fight off the blight disease. The method of "back-crossbreeding" American chestnuts with their blight-resistant predecessors is being used.

The goal is to have a hybrid Chinese and American chestnut tree able to cross back to the American versions, which once numbered in the billions in the United States of America. The trees would then provide pollen and seeds to create a new generation of highly resistant trees, according to the National Guard.

As of 2007, there were only 117 known American chestnut trees in west Tennessee, mainly in Hardeman and Fayette counties, according to a study by Joe Schibig, a professor at Volunteer State Community College. (*Source*: Jackson Sun, 27 July 2009.)

USDA proposes label for biobased products

Washington, DC. The United States Department of Agriculture (USDA) has proposed a labelling system to identify products made with renewable plant, animal and other biobased materials.

The BioPreferred labelling proposal is an outgrowth of the federal government's BioPreferred purchasing programme, which was created in the 2002 Farm Bill. The 2008 Farm Bill expanded the programme further to promote the sale of biobased products outside the government.

The proposal would set up a system in which companies could voluntarily apply the BioPreferred label to their products. USDA has already identified more than 15 000 biobased products in about 200 categories.

USDA hopes that a labelling system for biobased products will help consumers, businesses and governments easily identify biobased products, and also act as a marketing tool for the product makers and vendors.

USDA defines biobased products as items that are made up entirely or mostly of biological ingredients such as plant, animal, marine and forestry materials. A product would be able to use the BioPreferred label if it meets or exceeds USDA's minimum content requirements. (*Source*: GreenBiz.com, 5 August 2009.)

Honey standard

Florida recently passed a honey standard and is the first, and only, state to have done so. The standard is the first step towards getting adulterated honey off the store shelves and sets limits for, among other things, the amount of fructose, glucose, sucrose and moisture content defining honey.

Anyone selling honey in the state of Florida who violates this standard is subject to a US$500 fine. The Florida Department of Agriculture is depending on consumers to help enforce their new honey standard. (*Source*: examiner.com [United States of America], 31 August 2009.)

VENEZUELA (BOLIVARIAN REPUBLIC OF)

Árboles utilizados como PFNM: Zona Central Reserva Forestal Imataca

Un reciente trabajo presentado en el XIII Congreso Forestal Mundial (véase página 63) se realizó con el objetivo de caracterizar los productos forestales no madereros (PFNM), según el uso dado a las especies arbóreas por la población criolla que habita en la cuenca alta del Río Botanamo. Dicha cuenca está localizada en el borde oriental de la Reserva Forestal Imataca, la cual está habitada por diferentes grupos humanos asociados con ecosistemas boscosos de alta complejidad. Sus habitantes utilizan los PFNM como parte de sus recursos de subsistencia. Un total de 310 hogares fueron seleccionados aleatoriamente, encuestando una persona por hogar.

Las especies arbóreas fueron clasificadas por categoría y frecuencia de uso. El tamaño de la muestra fue definido con un nivel de confianza del 95 por ciento y un margen de error del 5,4 por ciento, (22 545 habitantes y 4 509 hogares). La identificación taxonómica de las especies arbóreas utilizadas fue hecha a partir de muestras recolectadas empleando métodos fitotaxonómicos tradicionales en el Laboratorio de Botánica y Dendrología de la Universidad Nacional Experimental de Guayana (UNEG).

El uso de las especies arbóreas se distribuye en seis grupos: medicinal (35 por ciento), alimento (32 por ciento), fibra y artesanía (13 por ciento), forraje (11 por ciento), colorante (7 por ciento) y ornamental (2 por ciento). Se destacan los usos medicinales y de alimentos. Las especies de mayor uso en la categoría de alimento son: *Mangifera indica, Inga* sp., *Spondias mombin, Psidium guajava* y *Persea americana* y en la de medicina: *Angostura trifoliata, Protium* sp., *Brownea* sp., *Mangifera indica, Spondias mombin, Annona muricata, Couratari multiflora, Cecropia peltata, Anacardium occidentale, Bixa orellana, Copaifera officinalis* y *Xylopia aromatica*.

El 76,6 por ciento de las especies arbóreas utilizadas como PFNM son nativas de los bosques de la localidad, lo cual refleja un alto grado de conocimiento y uso del bosque natural por parte de las comunidades criollas que habitan en el sector.

El nivel de ingreso promedio del 49 por ciento de las personas entrevistadas oscila entre $232,55 y $ 65,11 por mes. Con respecto al nivel educativo, el 33 por ciento sólo alcanza el grado de primaria, el 17 por ciento el nivel básico de bachillerato, el 23 por ciento el grado de bachiller y el 27 por ciento técnicos y otras profesiones. (*Fuente*: XIII Congreso Forestal Mundial, www.wfc2009.)

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Even if I knew that tomorrow the world would go to pieces, I would still plant my apple tree.

Martin Luther

BIODIVERSITY LOSS ACCELERATING, UN TARGET WILL BE MISSED

The world will not achieve its agreed target to stem biodiversity loss by 2010, the International Year of Biodiversity, say experts in Cape Town, South Africa, meeting for a science conference on the variety, abundance and conservation of plants and animals.

The target was agreed at a Conference of the Parties to the United Nations Convention on Biological Diversity in April 2003. Some 123 world ministers committed to "achieve, by 2010, a significant reduction of the current rate of biodiversity loss at the local, national and regional levels, as a contribution to poverty alleviation and to the benefit of all life on Earth".

"We will certainly miss the target for reducing the rate of biodiversity loss by 2010 and therefore also miss the 2015 environmental targets within the UN Millennium Development Goals to improve health and livelihoods for the world's poorest and most vulnerable people," says conference speaker Georgina Mace of Imperial College, London.

"Species extinction rates are at least 100 times those in pre-human times and are expected to continue to increase," says Mace, vice-chair of the international biodiversity science DIVERSITAS programme, opening its four-day Open Science Conference with 600 experts from around the world.

"It is hard to imagine a more important priority than protecting the ecosystem services underpinned by biodiversity," says Mace, who develops criteria for listing species on the IUCN Red List of Threatened Species and coordinating biodiversity inputs to the Millennium Ecosystem Assessment. "Biodiversity is fundamental to humans having food, fuel, clean water and a habitable climate. Yet changes to ecosystems and losses of biodiversity have continued to accelerate."

All primates, all cetacean whales and dolphins, all big cats such as leopards and tigers, all bears, all elephants, and all rhinoceroses are at risk, as evidenced by their listing by the Convention on International Trade in Endangered Species (CITES).

In Cape Town, scientists will preview the release next year of a report by the UN Convention on Biological Biodiversity

called the Global Biodiversity Outlook, to include a major focus on catastrophic biodiversity "tipping points", which complicate predictions. Such thresholds, if breached, will make global change impacts difficult to control, and slow and expensive to reverse.

"A great deal of awareness-raising is still much needed with respect to the planetary threat posed by the loss of so many species. The focus of biodiversity science today, though, is evolving from describing problems to policy relevant problem solving," says Stanford University Professor Hal Mooney, who chairs DIVERSITAS. (*Source*: Environment News Service, 13 October 2009.)

CAN NTFPS HELP CONSERVE THE AMAZON?

Industrial-scale logging and resource exploitation continue to plague the South American rain forests, contributing to their systematic destruction. Today, indigenous inhabitants and other local residents of the rain forests and their surrounding areas, faced with the enormous pressures of the global economy, often find themselves in a crucible. Many of their opportunities for supporting themselves and their families financially involve logging or other large-scale operations that deplete and ultimately decimate the forests. In order to make even a marginal living, local people often find themselves forced to participate in the destruction of the very ecosystems that they live in and depend on. In fact, a recent study in the prestigious journal *Science* has shown that, while deforestation (in the Brazilian Amazon) generates some short-term benefits, it fails in the longer term to improve the quality of life or increase affluence. Thus, deforestation is NOT a critical step towards development.

Instead, a two-pronged approach of compensation for allowing forests to stand, coupled with development of sustainable activities that maintain biodiversity and ecosystem services will be of greater benefit. As the world seeks to mitigate global warming and carbon emissions, this latter approach will become more and more desirable and feasible.

At Amazon Fund, we believe that it is possible for people of the rain forest to gain a viable living from their environment in a way that is sustainable and healthy for the ecosystem. Some of the hope for the future of the forests, plants, animals, people and the knowledge of the Amazon lies in NTFPs.

The following are some key points for understanding the role of NTFPs in the Amazon.

- NTFPs collected in a renewable and sustainable manner

AMERICAN FARMING TECHNIQUES TRANSFERRED TO THE AMAZON TO BOOST PROFITS

The "added-value" techniques that small-scale American farmers often employ to boost their profits could transfer quite well to the Amazon. For example, at an average American farmers' market, organic garlic might sell for US$5/pound (0.45 kg), but a decorative garlic braid, simple in design and easy to produce quickly, will easily sell for US$15 or 20, multiplying the income for the same quantity of garlic substantially beyond the increase in labour. Similarly, with creativity and a little effort, some by-products from forest industries or just from the forest itself could be easily, quickly and profitably transformed into new products. For example, if seeds are being gathered for sale for plant propagation, those that are unlikely to sprout and that otherwise would be discarded could be used for jewellery or other handicrafts.

THEY EARN MORE THAN FOUR TIMES AS MUCH AS IN A STANDARD "FAIRTRADE" OPERATION

The Kallari cooperative of Ecuador is an excellent example of a highly successful indigenous-operated collective based around forest agriculture and NTFPs. In its 12 years of operation, Kallari has expanded from 50 to 850 families, who earn more than four times as much as they would in a standard "fairtrade" operation. At the same time, they are preserving their rain forest and some of the traditional Kichwa ways by relearning to make handicrafts that can then be sold. One of the hallmarks of Kallari's success is its flexibility and appropriate response to changing markets, demands and situations. Kallari currently integrates cocoa farming with other NTFP-derived products, such as jewellery made from forest seeds and fibres. The cooperative seems amenable to making changes over time depending on the market, the forest and the people. Kallari serves as one potential model for viable incorporation of NTFPs in efforts to preserve the rain forests.

- Sustainable harvesting more economically sound than a one-time timber harvest
- Higher profit if the people have an active role in the retail
- American farming techniques transferred to the Amazon to boost profits
- Ecotourism could provide more opportunities
- Forest products are only one piece of the puzzle
- NTFPs earn more than four times as much as in a standard "fairtrade" operation.

As we work to decrease the deforestation of South American rain forests, we see that NTFPs could play a valuable role in the solution. Amazon Fund seeks to support sustainable use of NTFPs in its mission to preserve the forests. (*Source*: Amazon Fund, 20 July 2009.)

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COUNTRIES THAT INVEST IN CONSERVATION WILL SEE HIGHER FINANCIAL RETURNS, ARGUES REPORT

Policy-makers who factor the planet's multitrillion dollar ecosystem services into their national and international investment strategies are likely to see far higher rates of return and stronger economic growth in the twenty-first century, says a new report issued by The Economics of Ecosystems and Biodiversity (TEEB). Citing a study from south Thailand on the conversion of mangroves into shrimp farms, the report explains how commercial shrimp farms, while generating returns of around US$1 220 per hectare by clearing mangrove forests, are totalling over US$12 000 of losses per hectare linked with wood and NWFPs, fisheries and coastal protection services.

The economic invisibility of ecosystems and biodiversity is increased by our dominant economic model, which is consumption-led, production-driven and GDP (gross domestic product)-measured. The multiple crises we are experiencing – fuel, food, finance and the economy – serve as reminders of the need for change. (*Source*: mongabay.com, 13 November 2009.)

PAN-EUROPEAN BIODIVERSITY CONFERENCE FOCUSED ON ECOSYSTEM SERVICES, CLIMATE CHANGE IMPACTS

The Fifth Intergovernmental Conference on Biodiversity in Europe was held from 22 to 24 September 2009, in Liège, Belgium. The conference discussed the state of Europe's biodiversity and post-2010 biodiversity targets for the Pan-European region. It resulted in a "Message from Liège," in which European conservation leaders list a range of priorities and recommendations to conserve ecosystem services, address the biodiversity impacts of climate change and integrate biodiversity into other sectors.

A new target was suggested, to "halt any further loss of species and habitats and, by 2025, restoration of degraded areas with an emphasis on links between biodiversity, ecosystem services, climate change and human well-being". (*Source*: International Institute for Sustainable Development (IISD), September 2009.)

FOREST FUNDING AGREEMENT

Australia, France, Japan, Norway, the United Kingdom and the United States of America have today collectively agreed in the context of an ambitious and comprehensive outcome in Copenhagen to dedicate US$3.5 billion as initial public finance towards slowing, halting and eventually reversing deforestation in developing countries.

A joint statement follows: "Actions to reduce emissions from forests can help to stabilize our climate, support livelihoods, provide biodiversity conservation and promote economic development. As part of an ambitious and comprehensive deal, we recognize the significant role of international public finance in supporting developing countries' efforts to slow, halt and eventually reverse deforestation. With this in mind, we collectively dedicate US$3.5 billion of fast-start climate change financing for REDD+ over the 2010 to 2012 period. We regard this as an initial investment in developing countries that put forward ambitious REDD+ plans and that achieve forest emission reductions according to their respective capabilities. We collectively commit to scaling up our finance thereafter in line with opportunities and the delivery of results. We invite other donors to join us in this effort to make early action on REDD+ a reality."

United Kingdom Prime Minister Gordon Brown said: "Deforestation accounts for almost a fifth of global emissions, and the forests of the rain forest nations provide a global service in soaking up the pollution of the world. Unless action is taken, these forests could be lost forever, impacting not only on the global climate but on the livelihoods of 90 percent of the 1.2 billion people living in extreme poverty who rely on forest resources for their survival". (*Source*: United Kingdom Government Press Notice, 16 December 2009.)

THE WORLD'S THREE MAJOR TROPICAL FOREST REGIONS AGREE ON COLLABORATION

The intergovernmental regional organizations representing the world's three largest tropical forest regions (the Association of Southeast Asian Nations [ASEAN], the Amazon Cooperation Treaty Organization [ACTO] and the Central Africa Forests Commission [COMIFAC]) agreed to work more closely to enhance South-South cooperation in conserving and sustainably managing their tropical forests and biodiversity.

The three regions – primarily the Amazon, the Congo and Borneo – collectively contain more than 80 percent of the world's tropical forests, and an estimated two-thirds of all terrestrial species. (*Source*: IISD, 20 July 2009.)

UN EXPERTS ADVANCE PLANS FOR WEST AFRICAN BIODIVERSITY CORRIDOR

A plan to develop a biodiversity corridor across the border between Côte d'Ivoire and Liberia will be the focus of discussions to be held in Abidjan next week in cooperation with the United Nations and other organizations.

Hosted by the Ivorian Minister of Environment, Water Resources and Forests, the meeting from 5 to 6 October is part of a transnational initiative launched by the UN-led Great Apes Survival Partnership (GRASP) and the Wild Chimpanzee Foundation (WCF).

Among other objectives, the meeting aims to advance the idea of a biodiversity corridor between two large blocks of forest in the Upper Guinean forest region: the Sapo National Park in Liberia and the Taï National Park in Côte d'Ivoire.

The area is home to the largest block of a relatively intact tropical rain forest in West Africa, and to more than a quarter of Africa's mammals, including 12 species of primates and important chimpanzee populations, as well as endemic species such as pygmy hippopotamuses and forest elephants.

The meeting will bring together representatives of various stakeholder groups from both countries, including senior government officials, forestry and environment ministries, major international donors, development agencies, private sector and research institutions, indigenous populations and NGOs. They will discuss environmental conservation goals that simultaneously enhance stability, human security, sustainable development and long-term economic benefits in a conflict-prone region.

The initiative is financed and supported by the European Union, the French Fund for the World Environment, STEWARD (Sustainable and Thriving Environments for West African Regional Development) and WCF. (*Source*: UN News Centre, 1 October 2009.)

WILDERNESS CONGRESS CALLS FOR LINKING CLIMATE AND BIODIVERSITY CRISES

Held from 6 to 13 November 2009, in Mérida, Mexico, the 9th World Wilderness Congress adopted the "Message from Mérida", an international call for action to integrate wilderness and biodiversity conservation into a global climate change strategy.

During the meeting, an agreement on wilderness conservation was concluded and signed by the governments of Mexico, Canada and the United States of America. (*Source*: Linkages Update, 20 November 2009.)

WOODY PLANTS ADAPTED TO PAST CLIMATE CHANGE MORE SLOWLY THAN HERBS

Can we predict which species will be most vulnerable to climate change by studying how they responded in the past? A new study of flowering plants provides a clue. An analysis of more than 5 000 plant species reveals that woody plants – such as trees and shrubs – adapted to past

climate change much more slowly than herbaceous plants. If the past is any indicator of the future, woody plants may have a harder time than other plants in keeping pace with global warming, researchers say.

In a new study, biologists at the National Evolutionary Synthesis Center in Durham, North Carolina and Yale University (United States of America) teamed up to find out how flowering plants adapted to new climates over the course of their evolution. By integrating previously published genealogies for several plant groups with temperature and rainfall data for each species, they were able to measure how fast each lineage filled new climate niches over time.

When they compared woody and herbaceous groups, they found that woody plants adapted to new climates two to ten times more slowly than herbs. "Woody plants eventually evolved to occupy about the same range of climates that herbaceous plants did, but woody plants took a lot longer to get there," said lead author Stephen Smith, a postdoctoral researcher at the National Evolutionary Synthesis Center.

The researchers trace the disparity to differences in generation time between the two groups. Longer-living plants such as trees and shrubs typically take longer to reach reproductive age than fast-growing herbaceous plants, they explain. "Some woody plants take many years to produce their first flower, whereas for herbs it could take just a couple of months," said coauthor Jeremy Beaulieu, a graduate student at Yale University.

By understanding how plants responded to climate change in the past, scientists may be better able to predict which groups will be hardest hit by global warming in the future. "Woody groups are obviously at a disadvantage as the climate changes," Beaulieu explained.

Does this mean that ecosystems dominated by trees – such as rain forests – will be more likely to disappear? Possibly. "If we look to the past for our clues, chances are trees will continue to respond much more slowly than herbs – as much as ten times more slowly," Smith said. "But if the rate of climate change is 100 times faster, then they could all be in trouble. The kind of change we're experiencing now is so unprecedented," he added. While this study focused on long-term change over the last 100 million years, most climate models predict significant warming in the next century, the researchers explained. "That time frame may be too quick for any plant," Beaulieu said. (*Source*: ScienceDaily, 27 September 2009.)

WORLD'S LAST GREAT FOREST UNDER THREAT

The world's last remaining "pristine" forest – the boreal forest across large stretches of the Russian Federation, Canada and other northern countries – is under increasing threat, a team of international researchers has found.

The researchers from the University of Adelaide in Australia, Memorial University of Newfoundland in Canada and the National University of Singapore have called for the urgent preservation of existing boreal forests in order to secure biodiversity and prevent the loss of this major global carbon sink.

The boreal forest comprises about one-third of the world's forested area and one-third of the world's stored carbon, covering a large proportion of the Russian Federation, Canada, Alaska and Scandinavia. To date, it has remained largely intact because of the typically sparse human populations in boreal regions. That is now changing, say researchers and coauthors, Associate Professor Corey Bradshaw (Environment Institute, University of Adelaide), Associate Professor Ian Warkentin (Memorial University) and Professor Navjot Sodhi (National University of Singapore). "Much world attention has focused on the loss and degradation of tropical forests over the past three decades, but now the boreal forest is poised to become the next Amazon," says Associate Professor Bradshaw.

"Historically, fire and insects have driven the natural dynamics of boreal ecosystems," says Associate Professor Warkentin. "But with rising demand for resources, human disturbances caused by logging, mining and urban development have increased in these forests during recent years, with extensive forest loss for some regions and others facing heavy fragmentation and exploitation."

The findings have been published online in *Trends in Ecology & Evolution* in a paper called "Urgent preservation of boreal carbon stocks and biodiversity". (*Source*: Science Daily, 25 August 2009.) ♣

We do not inherit the land from our ancestors; we borrow it from our children.

Native American proverb

FAO

The World Summit on Food Security

With more than one billion people now suffering hunger, the international community met to reverse the situation and set the world on a path to achieving the realization of the right to adequate food.

The World Summit on Food Security took place at FAO headquarters in Rome from 16 to18 November 2009 and brought together over 4 700 delegates from 180 countries, including 60 Heads of State and Government as well as representatives of governments, United Nations agencies, intergovernmental organizations and NGOs, the private sector and the media. Delegates met throughout the Summit both for a High-level Segment and for a series of four round tables, which addressed the following topics: minimizing the negative impact of the food, economic and financial crises on world food security; implementation of the reform of global governance of food security; climate change adaptation and mitigation: challenges for agriculture and food security; and measures to enhance global food security, including rural development, smallholder farmers and trade considerations.

World leaders unanimously adopted a declaration pledging renewed commitment to eradicate hunger from the face of the Earth sustainably and at the earliest date.

Countries also agreed to work to reverse the decline in domestic and international funding for agriculture and promote new investment in the sector; to improve governance of global food issues in partnership with relevant stakeholders from the public and private sector; and to face proactively the challenges of climate change to food security.

To view the joint declaration approved by all members, please see: www.fao.org/wsfs/wsfs-list-documents/en/

The importance of forests and trees for the lives and livelihoods of men and women

A new guide – developed by FAO's Gender, Equity and Rural Employment Division – highlights the importance of forests and trees for the lives and livelihoods of men and women around the world. It also outlines FAO's new framework for making sure gender issues are taken into account in all of its work. Among the Organization's gender mainstreaming targets for 2008 to 2013 are to:

- include gender issues in socio-economic analysis and forest sector outlook studies, and encourage countries to provide sex-disaggregated data;
- promote methodologies for men and women to generate income from forests and trees in order to reduce poverty and to manage natural resources on a sustainable basis;
- develop and implement approaches that increase the participation of male and female stakeholders in forest-related processes and activities;
- promote equitable forest tenure systems through policies and laws that improve access to, and use and management of, forest resources for the benefit of men and women; and
- collect gender-disaggregated data on employment in public-funded forest research centres and graduation from forestry educational institutions.

(*Source: Gender equity in agriculture and rural development. A quick guide to gender mainstreaming in FAO's new strategic framework*. 2009.)

FOR MORE INFORMATION, PLEASE CONTACT: Gender, Equity and Rural Employment Division, Economic and Social Development Department, FAO, Viale delle Terme di Caracalla, 00153 Rome, Italy. E-mail: gender@fao.org; www.fao.org/gender/

A VOLUNTEER'S PERSONAL ACCOUNT

Among the most important days in FAO's history were probably 16–18 November 2009, when the World Summit on Food Security was held.

Preparations for this historic event were under way months ahead, and staff members were invited to participate by volunteering their time and expertise. As a young student of food security I could not pass up this unique opportunity to witness world leaders convene and discuss ways to eradicate hunger from the Earth.

My task as a volunteer was as a meeting room assistant; I had to attend high-level round tables and bilateral meetings and it was very exciting for me to observe first hand important discussions on such crucial and pressing issues.

During these meetings, it was clear to me that, regardless of the inevitable slow and bureaucratic proceedings of such a high profile event, all the participants felt the urgency to reach the common objective of finding ways to guarantee that everyone has access to the food they need. And this was probably the best memory I will take with me from this event. The atmosphere, especially between us volunteers, was that of knowing we were all working to reach this common goal regardless of our job or position during the summit. We all felt we were part of an effort to eliminate hunger around the world, even by simply making sure that the meetings ran smoothly.

I feel very fortunate to have experienced such a historic event. It not only gave me a unique opportunity to get a glimpse of what went on behind the scenes but it also reminded me of the wide role this Organization plays beyond our own everyday jobs: to improve the lives of the hungry and poor. (*Contributed by*: Agnese Bazzucchi, FAO volunteer, FAO's NWFP Programme.)

FAO IN THE FIELD

New project on NWFPs and food security in Central Africa started

The FAO project "Enhancing the contribution of NWFPs to poverty alleviation and food security in Central African countries" (GCP/RAF/441/GER), financed by the German Government, began its activities in July 2009. Since then, the institutional project start-up has taken place in the three participating countries: Gabon, Republic of the Congo and the Central African Republic, where project activities will be supervised by three national project coordinators from FAO and three focal points from the respective ministries in charge of forestry.

The regional coordination of the project, based in Cameroon, takes advantage of another ongoing FAO project on NWFPs in Cameroon and the Democratic Republic of the Congo, financed by the European Union (GCP/RAF/408/EC), by sharing the same office facilities. This allows close collaboration and synergy between the two projects, i.e. joint presentation at the 6th Plenary meeting of the Congo Basin Forest Partnership in November 2009, sharing of field experiences from Cameroon and the Democratic Republic of the Congo with new staff, or simply logistical aspects.

The next steps for the project in Gabon, Republic of the Congo and the Central African Republic will be the start-up workshop, which will bring together project representatives from the respective ministries in charge of forestry and FAO, as well as other relevant stakeholders. In each country, two pilot sites will be chosen to strengthen NWFP-based small- and medium-scale enterprises to benefit local communities and to promote sustainable harvesting methods, i.e. for *Gnetum* spp. (*koko* in the Central African Republic, *fumbwa* in the Congo and *nkoumou* in Gabon), which is a key species in the local diet in all three countries.

FOR MORE INFORMATION, PLEASE CONTACT:
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(Please see pages 43 and 44 – 45 for more information.)

THE XIII WORLD FORESTRY CONGRESS

Forests in development: a vital balance

Every six years, delegates from around the world and representatives from academia, civil society and the private sector gather to discuss the state of the world's forests, issues facing the sector and ways to manage forests sustainably. The event provides a forum to exchange views on trends and issues in forestry. It is also an opportunity to make recommendations to decision-makers and raise awareness among the public.

This year, the XIII World Forestry Congress, organized by FAO and the Government of Argentina, convened from 18 to 23 October in Buenos Aires, Argentina, attracting over 7 000 participants from 160 countries. The theme of the Congress – "Forests in development: a vital balance" – sought to address the social, ecological and economic aspects of sustainable forestry management in local, regional and global contexts. Over 60 panel sessions covering seven thematic areas were treated, tackling new and persisting challenges in forestry and development, including climate change, energy concerns, biodiversity loss and poverty.

One of the major outcomes of the Congress was a Final Declaration listing 27 strategic actions through which "the vital balance between forests and development can be improved". Among these was the imperative to initiate cross-sectoral actions at global, regional, national and local scales on some of the major issues facing humanity, such as climate change, bioenergy, water, biodiversity, food security and poverty alleviation, to reduce adverse impacts on forests. By addressing the multiple dimensions of sustainable forestry management and pressure arising from beyond the sector – including a changing climate, a growing population and economic turmoil – participants agreed forests would play a vital role in alleviating poverty and safeguarding biodiversity, as well as provide a broad range of goods and services for present and future generations. Moreover, "by considering forests as an integral part of wider economic and social development goals," said FAO Director-General Jacques Diouf, "we will make giant strides in our efforts to reduce poverty, hunger and malnutrition". The Congress also stressed that the environmental, economic and spiritual value of forests to human societies has not been fully recognized. In a message to the United Nations Framework Convention on Climate Change (UNFCCC), the XIII World Forestry Congress stated: "Forests harbour two-thirds of all land-based biodiversity and provide critical ecosystem services and goods, including water, food and income from over 5 000 commercial forest products. Forests sustain the cultural and spiritual identity of billions of people, foremost among them the indigenous peoples and local communities".

While the Congress acknowledged that sustainable forest management alone might be insufficient to address the many challenges facing humanity, it declared that managing forests sustainably contributes to achieving the vital balance between human beings and nature that is needed for sustainable development.

"The vital balance we all strive to achieve is not only in terms of the economic, environmental, social and cultural pillars of sustainable forest management. The challenge is far greater. The balance we seek is also in terms of our interface and collaboration with other sectors such as agriculture, energy, and water – where decisions affecting forests are often made."

FAO Director-General Jacques Diouf

Featuring among the discussions at the Congress was also a panel dedicated to NWFPs, their traditional uses and socio-economic impacts in the context of biodiversity conservation, small-scale forest enterprises and community forestry and trade. A number of speakers presented studies on the global situation of several NWFPs and their potential to benefit the livelihoods of local communities. Among them, Floriano Pastore (please see Box below for an extract from his paper), from the University of Brasilia/International Tropical Timber Organization (ITTO), Brazil, cited the case of natural rubber from the Brazilian Amazon, saying that extractive NWFPs face boom and bust cycles with initial production expansion being followed by contraction when demand exceeds natural production capacity and transfers from native forests to domesticated crops or alternative products.

The Congress also sent a strong message ahead of the UN Climate Change Conference in Copenhagen, stressing "the need to reduce poverty as a driver of deforestation and to safeguard the rights of indigenous peoples and forest-dependent communities". The message emphasized the important roles that the private sector and civil society play in climate change adaptation and mitigation. The issues of climate change, REDD (reduced emissions from deforestation and forest degradation) and the potential of carbon storage in fact generated the greatest interest at the Congress, particularly from Latin American countries, for their potential to increase investments in sustainable forest management through the climate regime. Dr William Jackson, Deputy Director-General of the International Union for Conservation of Nature (IUCN), told the Congress: "climate change has catapulted forests on to the international agenda after years of languishing in the dusty corridors of UN meetings".

FOR MORE INFORMATION, PLEASE CONTACT:
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Fax: +39 06 57055137; e-mail: info@cfm2009.org *or* WFC-XIII@fao.org; www.wfc2009.org *or* www.cfm2009.org.
www.iisd.ca/download/pdf/sd/ymbvol10num18e.pdf (summary of the Congress)

THE SPECIAL ROLE OF NTFPS IN MAINTAINING HARMONY BETWEEN USE AND SUSTAINABILITY OF TROPICAL FORESTS

A paper presented at the XIII World Forestry Congress discusses the importance of tropical forests for our common future, arguing that their health depends on addressing the social and environmental issues faced by the communities that live in forests. These communities extract products from the forest for their livelihoods; understanding this production system is essential to formulate approaches in dealing with the complex issue of forestry sustainability in all of its dimensions, says Floriano Pastore, the author of the paper.

Pastore presents an empirical conceptual model for the extraction cycle of NTFPs and discusses the main features of this activity. This model is composed of four stages: (i) Origin: the beginning of the production cycle; (ii) Propagation: division of trade and work; (iii) Conflict: consumption increases at a faster rate than production; and (iv) Solution: when the way out of domestication, substitution or synthesis provides the resolution of the problem and the extractive production loses competitiveness. Also presented are the elements for developing the production of timber, NTFPs and environmental services based on joint actions by private companies, communities, governments and NGOs. In such a model, NWFP-dependent communities play an important role in the harmony between multiple uses of the forest resources and conservation of tropical rain forests, says Pastore.

For more information, please contact: Floriano Pastore Jr, ITTO RO-LAC, University of Brasília, Brasilia, Brazil. E-mail: fpastorej@gmail.com

Small forest enterprises, big players

Locally controlled small and medium forest enterprises (SMFEs) provide livelihoods for forest communities around the world. Investments in commercial forest rights and legal frameworks, as well as capacity building for businesses along the whole forest product value chain, are some of the essential steps needed to address poverty and reduce deforestation. These were among the issues discussed at a round table session focusing exclusively on NWFPs and SMFEs on 22 October during the World Forestry Congress.

The session, moderated by FAO Forestry Officer Sophie Grouwels, drew over 200 participants. A number of guest speakers took the floor during the round table to discuss ways in which natural forest products could contribute to poverty alleviation and reduce deforestation. Among them, a study of a marketing strategy adapted to the development of the trade for dried *fumbua* (*Gnetum africanum*), produced by a Cameroonian SMFE for the domestic and European [ethnic food] market, was discussed. The traditional use and nutritional value of the species were explored, alongside its sustainable commercialization.

The session concluded with several main recommendations among others: to stimulate the integration of SMFEs within the public sector; disseminate market information to SMFE producer associations; support the sector's commercialization at national level; develop the market; and stimulate collaboration with commercial associations and service providers. During the round table, participants recommended that small producers should become more proficient and increase their knowledge in wood and non-wood processing technology to increase efficiency in the manufacturing sector. Finally, enhancing the certification of wood products and supporting research to have an overview of the entire SMFE value

chain(s) were stressed as vital. (*Source: Forest Energy Forum*. Summary report on small and medium forest enterprises. 22 October 2009.)

FOR MORE INFORMATION, PLEASE CONTACT: Sophie Grouwels, FAO Forestry Officer, FAO Forestry Department, Viale delle Terme di Caracalla, 00153 Rome, Italy. Fax: +39 06 57055137; e-mail: sophie.grouwels@fao.org

Working towards the sustainable use of bushmeat

The loss of tropical forest fauna is reaching critical levels, with commercial bushmeat hunting contributing to the scenario. The overexploitation of mammals, birds, reptiles and amphibians in many tropical and subtropical countries has global implications. Up to 75 percent of tropical tree species, for instance, depend on animal seed dispersal. Many tree species will no longer be able to reproduce without their seed dispersers, affecting ecosystem services. In turn, the degradation of forest ecosystems makes national and local economies weaker and more vulnerable to adversities such as climate change. The bushmeat trade – by increasing contact between humans and wildlife – also contributes to the spread of infectious diseases such as the Ebola and Nipah viruses. Above all, this biodiversity loss has impacts on food security for indigenous peoples and local communities.

In response, the Convention on Biological Diversity's Liaison Group on Bushmeat held its first meeting, in collaboration with FAO, the Center for International Forestry Research (CIFOR) and the International Council for Game and Wildlife Conservation (CIC), in Buenos Aires from 15 to 17 October 2009, in conjunction with the XIII World Forestry Congress. The meeting's objective was to develop policy recommendations for the sustainable use and conservation of bushmeat species.

In a joint statement to the World Forestry Congress, the group proposed a series of critical recommendations to decision-makers. Among these is the *sustainable management of wildlife*, which includes providing incentives and alternatives to hunters, traders and consumers. In response to *climate change*, the group recommended that mechanisms such as REDD+ take into account the importance of wildlife for healthy ecosystems and for the permanence of forest carbon stocks and forest adaptation capacity. Empowering local communities to manage and account for local resources in their own best interest was also stressed as key to managing bushmeat sustainably. At a policy level, the group urged for frameworks that involve the full participation of all stakeholders and for relevant sectors to be strengthened.

Up to 80 percent of protein intake in rural households in Central Africa comes from wild meat.

FOR A FULL REPORT, PLEASE CONTACT: Caroline Belair, Secretariat of the Convention on Biological Diversity, World Trade Centre, 413 St Jacques, Suite 800, Montreal, Quebec H2Y 1N9, Canada. Fax: +1 (514) 288 6588; e-mail: secretariat@cbd.int *or* Caroline.Belair@cbd.int; www.cbd.int

INTERNATIONAL YEAR OF BIODIVERSITY

Forests in development: a vital balance

The United Nations proclaimed 2010 to be the International Year of Biodiversity, and people all over the world are working to safeguard this irreplaceable natural wealth and reduce biodiversity loss. This is vital for current and future human well-being. We need to do more.

We are an integral part of nature; our fate is tightly linked with biodiversity, the huge variety of other animals and plants, the places in which they live and their surrounding environments, all over the world.

We rely on this diversity of life to provide us with the food, fuel, medicine and other essentials we simply cannot live without. Yet this rich diversity is being lost at a greatly accelerated rate because of human activities. This impoverishes us all and weakens the ability of the living systems, on which we depend, to resist growing threats such as climate change.

The International Year of Biodiversity is a unique opportunity to increase understanding of the vital role that biodiversity plays in sustaining life on Earth. Therefore, during this year we invite you to:

Learn
- About biodiversity in your city, region and country
- How your consumption patterns and everyday actions may impact on biodiversity, sometimes in distant ecosystems

Take action in 2010 and beyond, because
- **Biodiversity is life**
- **Biodiversity is our life**

Speak
- Make your views known to the government and the private sector
- Share your knowledge with people around you
- Send us your success stories so we can share them with the rest of the world

Act
- Make responsible consumption choices
- Support activities and organizations that conserve biodiversity
- Join a local environmental NGO or organize your own activities that will help biodiversity
- Be creative and find solutions to biodiversity loss
- Send us your pictures, artwork, videos and other creations, and we will share them with the world

Throughout the year, hundreds of events and celebrations have been organized worldwide by the Secretariat of the Convention on Biological Diversity and its partners, starting on 11 January 2010 in Berlin with the launch of the International Year of Biodiversity.

FOR MORE INFORMATION ON THE EVENTS AND HOW TO GET INVOLVED, PLEASE CONTACT: Secretariat of the Convention on Biological Diversity, 413 St Jacques, Suite 800, Montreal, Quebec H2Y 1N9, Canada. Fax: +1 (514) 288 6588; e-mail: iyb2010@cbd.int; www.cbd.int/2010 ♣

ASOCIACIÓN COSTARRICENSE DE BAMBÚ (ACOBAMBU) , SIMPOSIO: «EL BAMBÚ EN COSTA RICA: UNA PERSPECTIVA PARA EL DESARROLLO»

LOS COLEGIOS DE MORAVIA, COSTA RICA
31 DE JULIO Y 1 DE AGOSTO DE 2009

Temas:

- Los bambúes en Costa Rica y el mundo
- Generalidades y usos del bambú
- El bambú en asocio con sistemas productivos
- Bambúes en la recuperación de cuencas hidrográficas
- Ecoconstrucciones con bambú

PARA MÁS INFORMACIÓN, DIRIGIRSE A:
Asociación Costarricense de Bambú, Calle 7 – Avenida 9 y 11, Heredia, Costa Rica.
www.acobambu.org

2ND WORLD CONGRESS OF AGROFORESTRY: THE FUTURE OF GLOBAL LAND USE

NAIROBI, KENYA
23–28 AUGUST 2009

The congress assessed opportunities to leverage scientific agroforestry in promoting sustainable land use worldwide. It also served as a forum for agroforestry researchers, educators, practitioners and policy-makers from around the world to:

- share new research findings, lessons, experiences and ideas that will help influence decisions that impact on livelihoods and the global environment;
- explore new opportunities and strengthen existing partnerships in agroforestry research, education, training and development; and
- form new networks and communities of practice, and nurture old ones.

The overall congress theme was "Agroforestry – the Future of Global Land Use". Plenary, symposia, concurrent sessions and poster sessions were organized around different major topics, based on the following: Food security and livelihoods; Conservation and rehabilitation of natural resources; and Policies and institutions.

FOR MORE INFORMATION, PLEASE CONTACT:
2nd World Congress of Agroforestry, World Agroforestry Centre (ICRAF), PO Box 30677-00100 GPO, Nairobi, Kenya. Fax: +254 20 722 4001 *or* +1 650 833 6646; e-mail: wca2009@cgiar.org; www.worldagroforestry.org/wca2009/

INTERNATIONAL CONFERENCE: FORESTS, MARKETS, POLICY & PRACTICE

SHANGHAI, CHINA
8–9 SEPTEMBER 2009

This intensive two-day conference examined trends in legal and certified forests and markets – globally and in China – and explored ways to harmonize policy and practice and enhance capacity for positive change. Its objectives were to explore public policies and business practices designed to bring legal and certified forest products to market, and to enhance capacity to take advantage of opportunities and address challenges posed by changing policy and business environments.

FOR MORE INFORMATION, PLEASE CONTACT:
Rainforest Alliance, 665 Broadway, Suite 500, New York, NY 10012, United States of America. E-mail: mthiemann@ra.org; www.rainforest-alliance.org/news.cfm?id=china_certified

8TH WORLD BAMBOO CONGRESS

BANGKOK, THAILAND
16–19 SEPTEMBER 2009

Over 400 attendees from more than 40 countries participated in the 8th World Bamboo Congress. Comprehensive sessions were covered over three days on:

- bamboo in Thailand and Southeast Asia
- bamboo and the environment
- biology and taxonomy
- resources – plantations, forestry and conservation
- material properties
- production, design and industrial aspects
- horticulture
- community and economic development
- architecture and engineering
- In Partnership for a Better World (INBAR)

The congress was an immense success and a culmination of the efforts of the World Bamboo Organization (WBO) to unite physically bamboo enthusiasts and professionals from all over the world and especially throughout Thailand and Southeast Asia.

WBO is dedicated to promoting the use of bamboo and bamboo products for the sake of the environment and the economy. We play a crucial networking role by connecting people for useful collaboration on all things related to bamboo. Our primary directive is as events organizer of the World Bamboo Congress.

To coincide with the 113th anniversary of Thailand's Royal Forest Department, 18 September was declared World Bamboo Day. This declaration is an effort to increase the awareness of bamboo globally. Where bamboo grows naturally, it has been a daily element, but its utilization has not always been sustainable because of exploitation. WBO wants to bring the potential of bamboo to a more elevated exposure – to protect natural resources and the environment, ensure sustainable utilization and promote new cultivation of bamboo for new industries, as well as promote traditional uses locally and for community economic development.

FOR MORE INFORMATION, PLEASE CONTACT:
Mr Kamesh Salam, President, WBO and Conference Secretary, World Bamboo Organization, 9 Bloody Pond Road, Plymouth, MA 02360, United States of America. E-mail: kamesh@caneandbamboo.org; www.worldbamboocongress.org *or* www.worldbamboo.net
(For more information on World Bamboo Congress, please see page 14.)

11TH ANNUAL BIOECON CONFERENCE ON "ECONOMIC INSTRUMENTS TO ENHANCE THE CONSERVATION AND SUSTAINABLE USE OF BIODIVERSITY"

VENICE, ITALY
21–22 SEPTEMBER 2009

This conference was targeted at researchers, environmental professionals, international organizations and policy-makers interested in working in the management and conservation of biodiversity. It focused on identifying the most effective and efficient instruments for biodiversity conservation, such as auctions of biodiversity conservation contracts, payment-for-services contracts, taxes, tradable permits, voluntary mechanisms and straightforward command and control. Special emphasis was given to policy reforms aimed at increasing the commercial rewards for conserving biodiversity, increasing the penalties for

biodiversity loss and circulating information on the biodiversity performance requirements of firms. An increasing number of businesses, which were responsible for biodiversity loss in the past, are now supporters of biodiversity conservation. Markets for organic agriculture and sustainably harvested timber are developing at double-digit rates, while rapid growth is observed in the demand for climate mitigation services, such as the protection of forests and wetlands to absorb carbon dioxide. Bioprospecting, the search for new compounds, genes and organisms in the wild, is another biodiversity business on the rise.

Leading international environmental economists presented their latest research in two plenary sessions. The agenda also included two panel discussions: (i) European Investment Bank session on Valuing ecosystem services: the link between theory and practice; and (ii) Conservation International session on Applying economic instruments to enable people to conserve biodiversity and ecosystem services.

FOR MORE INFORMATION, PLEASE CONTACT: Ms Ughetta Molin Fop. Fax +39.041.2711461; e-mail: ughetta.molin@feem.it; http://bioecon.meetingvenice.it/

FORUM ON NON-TIMBER FOREST RESOURCES

NANAIMO, BRITISH COLUMBIA, CANADA
6 NOVEMBER 2009

The Centre for Non-Timber Resources at Royal Roads University hosted a one-day forum on non-timber forest resources entitled "Non-timber Forest Resources: Linking Research, Policy and Economic Opportunities". The forum attracted more than 90 participants from First Nations, all levels of government, private and band-owned businesses, community development specialists, resource managers, researchers and NGOs. There was also a strong representation from the Canadian Model Forest Network and the Forest Communities Program from across Canada, from the Clayoquot Forest Communities in British Columbia to the Model Forest of Newfoundland & Labrador. The 15 speakers in the forum included business owners who shared practical experience, researchers and government representatives who discussed ecology and management, consumer perceptions and policy, and representatives of a range of innovative development and support initiatives.

Proceedings from the forum will soon be made widely available to participants and other interested parties.

FOR MORE INFORMATION, PLEASE CONTACT: Centre for Non-Timber Resources, Royal Roads University, 2005 Sooke Road, Victoria, British Columbia V9B 5Y2, Canada. Fax: +1-250-391-2563; e-mail: bcwild@royalroads.ca; http://buybcwild.com/2009-ntfr-forum

4TH GLOBAL SUMMIT ON MEDICINAL AND AROMATIC PLANTS

SARAWAK, MALAYSIA
1–5 DECEMBER 2009

The summit provided a forum for research scientists, traditional health practitioners, academicians, representatives from the medical and pharmaceutical industries, conservation biologists, biochemists, NGOs and government agencies to discuss, share ideas, advance information and experiences for future collaboration in the promotion and development of the medicinal and aromatic plant industries.

FOR MORE INFORMATION, PLEASE CONTACT: Dr V. Sivaram, Department of Botany, Bangalore University, Bangalore – 560056, India. Fax: 91-80-22961315; e-mail: gosmap2009@gmail.com; www.gosmap.in

AFRICAN FORESTRY AND WILDLIFE COMMISSION

BRAZZAVILLE, REPUBLIC OF THE CONGO
22–26 FEBRUARY 2010

Every two years, the African Forestry and Wildlife Commission (AFWC) meets to discuss and address forest and wildlife issues in the African continent. Created in 1959, AFWC is one of six Regional Forestry Commissions established by FAO to provide a policy and technical forum for countries to discuss and address forest and wildlife issues in their respective regions. The year 2010 will mark the 17th session of the Commission. The gathering will be in conjunction with the first-ever African Forestry and Wildlife Week. The theme of the events will be common to all: "African Forests and Wildlife: Response to the Challenges of Sustainable Livelihood Systems".

The session will seek to highlight the important contribution of forests and wildlife to reducing poverty, hunger and malnutrition in Africa. The introduction of an entire week dedicated to African forests and wildlife aims to draw the attention of policy-makers to the contribution of forests and wildlife to the national economy and to the lives and livelihoods of the African people. Some 400 participants from a variety of backgrounds are expected at the event, including policy-makers and practitioners from the public and private sectors, NGOs, civil society organizations and development agencies, as well as experts from academia. They will discuss and exchange knowledge on the social, economic and environmental values of forests and wildlife and the need to manage them sustainably, particularly in the face of current global trends such as the financial and food crises and climate change.

FOR MORE INFORMATION, PLEASE CONTACT: Mr Foday Bojang, Senior Forestry Officer, FAO Regional Office for Africa, Gamel Abdul Nasser Road, PO Box 1628, Accra, Ghana. Tel.: 233-21-675-000, ext.3202; fax: 233-21-668-427; e-mail: foday.bojang@fao.org *or* afwc@fao.org; www.fao.org/forestry/afwc

GLOBAL SHEA 2010: MAXIMIZING QUALITY, EXPANDING MARKETS

BAMAKO, MALI
16–19 MARCH 2010

Global Shea 2010 is the most important annual event of the shea industry. From pickers to processors, researchers to buyers, Global Shea 2010 will put you in touch with people working in every part of the industry.

FOR MORE INFORMATION, PLEASE CONTACT: Dr Peter Lovett, West Africa Trade Hub Shea Sector Expert, West Africa Trade Hub, c/o USAID, PO Box 1630, Accra, Ghana. E-mail: plovett@watradehub.com *or* info@globalshea.org; www.globalshea.org

TAKING STOCK OF SMALLHOLDER AND COMMUNITY FORESTRY: WHERE DO WE GO FROM HERE?

MONTPELLIER, FRANCE
24–26 MARCH 2010

CIFOR (the Center for International Forestry Research), IRD (the French Institute of Research for Development) and the French International Cooperation Centre of Agricultural Research for Development

(CIRAD) will be hosting this international conference.

Conference sessions will be organized to maximize comparisons of key topics drawing on cases in temperate and tropical forests from around the world. Topics will include:

- relations between local forest practices and environmental, forestry or multisectoral policies and regulations;
- organizational patterns, institutions and governance concerns, including tenure and rights;
- practices and knowledge, particularly the interactions between local and extralocal systems (professional forest knowledge, NGOs, scientific knowledge);
- management and marketing issues regarding timber, NTFPs and multiple-use management, including relations with the private sector and new certification mechanisms (ecolabelling, fairtrade and geographic origins);
- gender issues;
- property, legitimacy or rights issues;
- approaches and methods for supporting smallholder and community forestry (NGOs, extension services);
- the role of the state and NGOs.

FOR MORE INFORMATION, PLEASE CONTACT:
Laurène Feintrenie, IRD-CIFOR, BP 0113 BOCBD, Bogor 16000, Indonesia. E-mail: l.feintrenie@cgiar.org; www.cifor.cgiar.org/Events/Smallholder+and+community+forestry/Introduction.htm

IOF (INSTITUTE OF FORESTRY) FOREST-PEOPLE INTERACTION CONFERENCE

POKHARA, NEPAL
7–8 JUNE 2010

Themes to be covered during the conference include:

- community-based forest management and livelihood strategies;
- biodiversity and environmental services;
- forest and tree management practices; and
- forest policy, management and governance.

FOR MORE INFORMATION, PLEASE CONTACT:
Dr Krishna P. Devkota, Organizing Secretary, Forest-People Interaction Conference, Institute of Forestry, PO Box 43, Pokhara, Nepal. Fax: 061-432078, 431563; e-mail: conference2010@iof.edu.np

2010 INBAR BAMBOO TOUR TO CHINA

CHINA
MID-JUNE 2010

The International Network for Bamboo and Rattan (INBAR) has been successfully organizing bamboo study tours in China in cooperation with the World Agroforestry Centre (ICRAF) since 2005. The objective of the annual tour is to share the experiences of Chinese bamboo development and promote bamboo development in other countries.

The 2010 bamboo tour to China will visit EXPO Shanghai, and Zhejiang and Sichuan provinces.

In Zhejiang, we will visit some leading bamboo flooring manufacturers, such as DASSO (which produced the bamboo fireproof ceiling for Madrid's international airport [winning the 2006 Sterlinz prize], is producing bamboo veneer to be used for the interior decoration of 70 000 BMW cars and is also a 40 m-long bamboo wind turbine blade manufacturer); Yafeng (which produces strand-woven bamboo lumber and flooring); Yongyu (bamboo flooring); Shengbang (bamboo concrete forms, a supplier for the 2010 EXPO in Shanghai); Xieqiang (bamboo curtains and mats); Kangxing bamboo-shoot processing company; Shenshi bioproduct company (bamboo extracts such as flavonoids, bamboo beer); Wenzhao, the biggest bamboo charcoal company (charcoal and vinegar); the only Bamboo Charcoal Museum in the world; some primitive processing workshops (bamboo strips) at the community level; Huachun bamboo furniture company; Jitai bamboo-processing machine company and Anji bamboo product market (hundreds of bamboo products, including bamboo clothes).

We will also visit the largest bamboo botanic garden in the world, Anji Bamboo Garden, which has more than 300 bamboo species plus two giant pandas, as well as the Chinese Bamboo Museum in its garden; a high-yielding bamboo plantation; a bamboo film production base; ecotourism sites; an ornamental bamboo nursery; Baisha ecotourism village; companies and communities dealing in NTFPs such as ginkgo, hickory and traditional dry bamboo shoots; and the Hangzhou West Lake and China Silk Museum. Furthermore, we will visit some bamboo research institutions such as Zhejiang Forestry College (bamboo charcoal, bamboo tissue culture laboratory).

We try to dialogue with local politicians and experts on bamboo sector policies and technology, which encourage entrepreneurs to invest in other bamboo production countries in Africa, Asia and the Americas.

In Sichuan province, we will visit Wangjiang Bamboo Park (with nearly 200 tropical bamboo species); the Living Water Park (which shows wastewater treatment by plants and biotechnology and has won a UNEP award); Chengdu Giant Panda Centre (with more than 100 pandas); the world famous Dujiangyan irrigation system; the INBAR bamboo handicrafts training base in Qingshen; and the China Bamboo Weaving Museum, Strand Woven Bamboo company.

We will stay two days in Shanghai to visit EXPO Shanghai 2010, the most exciting global event in 2010, where many places will be decorated with bamboo.

FOR MORE INFORMATION, PLEASE CONTACT:
Fu Jinhe, Ph.D., Senior Programme Officer, International Network for Bamboo and Rattan (INBAR), 8 Fu Tong Dong Da Jie, Wang Jing Area, Chao Yang District, Beijing 100102, China. Fax: +86-10-6470 2166; e-mail: jfu@inbar.int; www.inbar.int

18TH COMMONWEALTH FORESTRY CONFERENCE

EDINBURGH, UNITED KINGDOM
28 JUNE–2 JULY 2010

The theme of the conference is "Restoring the Commonwealth's Forests: Tackling Climate Change". The organizers are keen to encourage the submission of papers on successful restoration case studies.

FOR MORE INFORMATION, PLEASE CONTACT THE CONFERENCE ORGANIZERS:
18th Commonwealth Forestry Conference, c/o In Conference Ltd, 4–6 Oak Lane, Edinburgh EH12 6XH, Scotland, United Kingdom. Fax: +44 131 339 9798; e-mail: cfcc@in-conference.org.uk; www.cfc2010.org ♣

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This book presents a comprehensive – and sobering – view of how human medicines, biomedical research, the emergence and spread of infectious diseases and the production of food, both on land and in the oceans, depend on biodiversity. The book's ten chapters cover everything – from what biodiversity is and how human activity threatens it, to how we as individuals can help conserve the world's richly varied biota. Seven groups of organisms, some of the most endangered on Earth, provide detailed case studies to illustrate the contributions they have already made to human medicine, and those they are expected to make if we do not drive them to extinction. *Sustaining life* argues that we can no longer see ourselves as separate from the natural world, nor assume that we will not be harmed by its alteration. Our health, as the authors so vividly show, depends on the health of other species and on the vitality of natural ecosystems. (*Please see page 11 for more information.*)

Chupezi, T.J., Ndoye, O., Tchatat, M. & Chikamai, B. 2009. Processing and marketing of non-wood forest products: potential impacts and challenges in Africa. *Discov. Innov.*, 21 (SFM Special Edition No. 1).

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The medicinal and culinary uses of honey have been well known for millennia. The therapeutic properties of honey not only result from its antimicrobial activity, but also from its capacity to promote wound healing. Citing ancient records, the editors of this book explain how honey was used extensively in Egyptian medicine. Although ancient use relied on local honeys, today there are controlled, licensed products that have undergone the scrutiny of regulatory bodies. With the emergence of antibiotic resistance in microorganisms, there is a need to find effective treatments. Moreover, the potential use of honey in treating diabetic foot ulcers as well as in pediatric care, oncology, radiotherapy, damaged tissue and burns has shown promising results, which need to be explored further.

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Fa, J.E. & Brown, D. 2009. Impacts of hunting on mammals in African tropical moist forests: a review and synthesis. *Mammal Review*, 39(4): 231–264.
This article reviews available information on the consumption of wild meat in West and Central Africa. The authors show that mammals are the prime source of bushmeat, and that ungulates and rodents make up the highest proportion of biomass extracted. They present data on current knowledge of extraction patterns of wild mammals in West and Central Africa, and evidence that at current offtake levels, within the range states, mammals as bushmeat are being depleted on an unprecedented scale. Extraction rates are orders of magnitude higher there than in comparable ecosystems such as the Amazon, and much less likely to be sustainable. However, basic knowledge of the biology of harvestable tropical moist forest mammals, and the consequences of hunting on mammalian communities, which permit accurate estimation of maximal production rate (the excess of growth over replacement rate), are largely unavailable, and this hinders estimation of hunting quotas and sustainability. Comparisons are made with the existing information available on Amazon basin mammals and hunting patterns reported there.

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Hammett, A.L., Chamberlain, J. & Winn, M. 2009. Finding effective ways to provide knowledge to forest managers about non-timber forest products: a case-study of distance learning approaches. *General Technical Report*, SRS-116, 215–222. Asheville, North Carolina, Southern Research Station.
Many who grow or collect NTFPs have been underserved in traditional forestry educational programmes. It has often been difficult to determine the needs of this disparate group of stakeholders as collectors and growers are widely dispersed across the landscape, and not recognized as important stakeholders in formal cost forest management or forest products outreach programmes. In most cases they may not attend or participate in traditional forestry education programmes. Forest managers and extension agents, who serve this clientele, lack information and knowledge concerning NTFPs and are challenged to serve these stakeholders' needs. Distance learning methods may be an efficient and low-cost way to teach collectors, growers and the extension agents who serve this group of stakeholders about how to manage and utilize NTFPs in a sustainable way. The authors examine distance learning methods, such as video conferencing and online courses, to determine if they are appropriate for training those who harvest and utilize NTFPs.

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(*Please see pages 15–16 for more information.*)

International Institute for Environment and Development. 2009. *Just forest governance: how small learning groups can have big impact*. IIED Briefing Paper.
Forests are power bases, but often for the wrong people. As attention turns from making an international deal on REDD to making it work on the ground, the hunt will be on for practical ways of shifting power over forests towards those who enable and pursue sustainable forest-linked livelihoods. The Forest Governance Learning Group (FGLG) – an alliance active in Cameroon, Ghana, India, Indonesia, Malawi, Mozambique, South Africa, Uganda and Viet Nam – has developed practical tactics for securing safe space, provoking dialogue, building constituencies, wielding evidence and interacting politically. It has begun to have significant impacts. To deepen and widen those impacts, FGLG seeks allies. Download: www.iied.org/pubs/display.php?o=17070IIED

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Products from the wild, also known as non-timber forest products (NTFPs), are used as medicines, cosmetics, drinks, foods, decorations and for a multitude of other purposes. They contribute substantially to rural livelihoods, generate revenue for companies and governments, and have a range of impacts on biodiversity conservation; yet there is little information available for those seeking to develop effective policy frameworks and regulation. This guide addresses that shortage with technical information on the drafting, content and implementation of NTFP policies, and the broader issues of governance associated with these products. It also develops an analytical framework for understanding the diverse issues and elements that combine to create laws and policies promoting sustainable and equitable management, trade and use of species. Drawing on a wealth of unique case studies that represent many regions of the world, this volume examines experiences with NTFP regulation, including its sometimes unintended consequences. It looks at economic factors, the interface between traditional and scientific knowledge, and relationships between NTFP regulation, land tenure and resource rights, as well as power and equity imbalances.
A policy brief with findings from this study, *Wild product governance: laws and policies for sustainable and equitable non-timber forest product use*, is available from the Web site (under new People and Plants International [PPI] resources).
Download:
http://peopleandplants.squarespace.com/
(*Please see page 20 for more information.*)

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Se reconoce que los PFNM son importantes para el bienestar de muchas comunidades rurales y contribuyen a los procesos de conservación de los bosques tropicales. Como una aproximación al conocimiento del impacto ocasionado por su aprovechamiento, y a partir de la revisión de varios estudios, el presente artículo expone las consecuencias de esta actividad en diferentes niveles ecológicos (individuo, población y ecosistemas) y las formas y los efectos del aprovechamiento, presentando el estado actual y las tendencias de investigación que conllevan a un uso y a un manejo sostenible de los PFNM. Se concluye que es prioritario el estudio de estos productos de manera sistémica, que debe ir más allá del contexto ecológico y biológico, donde se involucren los componentes sociales, económicos, culturales y políticos, logrando el desarrollo de modelos predictivos que garanticen el no deterioro de estos recursos.

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Most of the world's population that derive their livelihoods or part of their livelihoods from forests are out of the information loop. Exclusion of public users of natural resources from access to scientific research results is not an oversight; it is a systemic problem that has costly ramifications for conservation and development. Results of a survey of 268 researchers from 29 countries indicate that institutional incentives support the linear, top-down communication of results through peer-reviewed journal articles, which often guarantee positive performance measurement. While the largest percentage of respondents (34 percent) ranked scientists as the most important audience for their work, only 15 percent of respondents considered peer-reviewed journals effective in promoting conservation and/or development.

Respondents perceived that local initiatives (27 percent) and training (16 percent) were likely to lead to success in conservation and development, but few scientists invest in these activities. Engagement with the media (5 percent), production of training and educational materials (4 percent) and popular publications (5 percent) as outlets for scientific findings were perceived as inconsequential (14 percent) in measuring scientific performance. Less than 3 percent of respondents ranked corporate actors as an important audience for their work. To ensure science is shared with those who need it, a shift in incentive structures is needed that rewards actual impact rather than only "high-impact" journals. Widely used approaches and theoretical underpinnings from the social sciences, which underlie popular education and communication for social change, could enhance communication by linking knowledge and action in conservation biology.
(*Please also see Dr Shanley's guest article in* Non-Wood News 19.)

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NEW PUBLICATIONS FROM FAO'S NON-WOOD FOREST PRODUCTS PROGRAMME

NWFP Working Documents

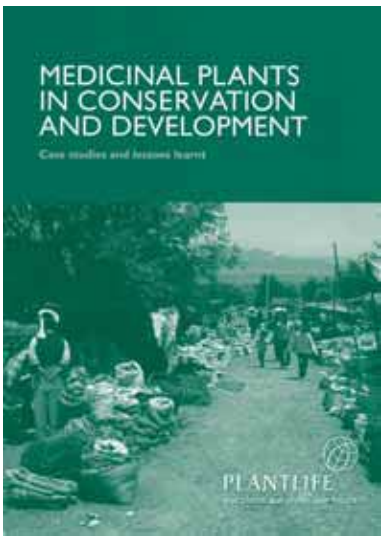
A new volume has been added to FAO's NWFP Working Documents – No. 8: *The poor man's carbon sink: bamboo in climate change and poverty alleviation*, by Maxim Lobovikov, Yiping Lou, Dieter Schoene and Raya Widenoja.

Bamboo, best known by many as food for giant pandas, has been overlooked in the current climate change regime. Bamboos are missing from the Marrakech Accords definition of forests, as well as from Intergovernmental Panel on Climate Change (IPCC) Assessments and IPCC Guidelines for greenhouse gas inventories and reporting. Botanically not trees but grasses, and related to wheat, rye, barley, maize and sugarcane, bamboos cannot, verbatim, form forests consisting of trees, as defined by the Kyoto Protocol. Nevertheless, with good reason they have been dubbed the "poor man's timber". The label conveys a near perfect match of bamboo to the goals of the Clean Development Mechanism in forestry, namely, poverty reduction and carbon sequestration.

An electronic version of this document will be available shortly from our NWFP home page. Hard copies are available free of charge from FAO's NWFP Programme at the address on the first page or by sending an e-mail to non-wood-news@fao.org
(*Please see page 12 for more information.*)

OTHER RECENT PUBLICATIONS

Medicinal plants in conservation and development



Hamilton, A.C. (ed.). 2008. *Medicinal plants in conservation and development: case studies and lessons learnt*. Salisbury, United Kingdom, Plantlife International. ISBN 978-1-904749-15-8.
(*The photographs from this book have been used to illustrate the back page of this issue of* Non-Wood News; *please also see pages 32–33 for more information.*)

Underutilized fruits and nuts

Pareek, O.P. & Sharma, S. 2009. *Underutilized fruits and nuts*. Jaipur, India, Pointer Publishers. ISBN 978-81-7910-282-4.
This book has been published in two volumes. The first volume outlines the "diversity and distribution" of underutilized fruits and nuts and provides collated information on their value in "food and nutrition security", in "livelihood and income security", on "development of value added and commercially useful products" and for the "rehabilitation and conservation of the ecosystem". The available information on distribution, uses, botany and culture of 56 subtropical and 39 temperate fruits is also included. Appendixes cover "botanical and other names of the fruits suitable for humid, semi-arid and arid regions of tropical, subtropical and temperate areas", "families, genera and species" and the "food value" of these fruits and their "use in agroforestry systems".

The second volume gives available information on distribution, uses, botany and culture of 157 tropical fruits that have potential to be promoted for systematic cultivation. The "epilogue" at the end of this volume outlines the suggestions on the required activities intended to be of help to develop participatory research and developmental work on neglected and underutilized fruits.

The fruits of the subtropical and temperate groups (in the first volume) and those of the tropical group (in the second volume) have been further divided into three sections, i.e. fruits for humid, semi-arid and arid regions to enable selection of the right species for cultivation to suit a given environment. The fruits in each section have been arranged alphabetically according to their common names. Botanical and other names of the fruits and nuts have been given in the text. The book has been illustrated with line diagrams and

coloured photographs of several of these fruits and nuts.

FOR MORE INFORMATION, PLEASE CONTACT THE AUTHORS: Dr Om Prakash Pareek, Central Institute for Arid Horticulture, Bikaner – 334006, India (Res. – A-239, Karninagar Lalgarh, Bikaner 334001) *or* Dr Suneel Sharma, Professor, Faculty of Horticulture, CCS Haryana Agricultural University, Hisar 125004, Haryana, India. E-mail: sharma.suneel@yahoo.com

FAO DIVERSIFICATION BOOKLETS

These booklets aim to provide information on the diverse types of possible diversification and income-generating activities possible at the farm and local community level. Each booklet focuses on a different type of farm or non-farm enterprise or technology that can be adopted by small farms or local enterprise groups. The target audiences for the booklets are people and organizations that provide advisory, business and technical support services to small-scale farmers and local communities in low- and middle-income countries.

A recent booklet in this series focused on NWFPs: *Non-farm income from non-wood forest products*, extracts of which can be found on page 5.

For more information, please contact: Rural Infrastructure and Agro-Industries Division (AGS), FAO, Viale delle Terme di Caracalla, 00153 Rome, Italy. E-mail: AGS-registry@fao.org; www.fao.org/Ag/AGS/publications/en/diversification.html ♣

Year	Vol.	Title
2004	1	Beekeeping and sustainable livelihoods (E, F, S)
2004	2	Livelihoods grow in gardens (E, F, S)
2004	3	Poultry for profit and pleasure (E, F, S)
2004	4	High hopes for post-harvest (E, F, S)
2004	5	Processed foods for improved livelihoods (E, F, S)
2009	6	Milk for health and wealth (E)
2009	7	Make money by growing mushrooms (E)
2009	8	Higher value addition through hides and skins (E)
2009	9	Sheep and goats for diverse products and profits (E)
2009	10	Rural transport and traction enterprises for improved livelihoods (E)
2009	11	Growing vegetables for home and market (E)
2009	12	Non-farm income from non-wood forest products (E)
2009	13	Farm ponds for water, fish and livelihoods (E)

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.fao.org/forestry/site/6367/en

ACP-FLEGT Support Programme
The Forest Law Enforcement, Governance and Trade Support Programme for African, Caribbean and Pacific countries (ACP-FLEGT Support Programme) is a collaborative effort among FAO, the European Commission and the African, Caribbean and Pacific Group of States (ACP) to address forest law enforcement, governance and trade issues in ACP member countries.
www.fao.org/forestry/acp-flegt/en/

Earthscan: live interactive Web events from sustainability experts
From August 2009, Earthscan will offer a free one-hour Webcast on a different topic each month, giving viewers the opportunity to learn from, and interact with, leading authorities from a range of different fields.

The audio presentations will be accompanied by illustrative slides and viewers will have the opportunity to contribute to discussions by submitting questions during the events. The subjects covered will include all of Earthscan's specialities, including business, climate change, energy, the built environment and natural resource management.

The first earthcast, entitled *Carbon markets and climate change mitigation*, was broadcast on 19 August 2009.
www.earthscan.co.uk/earthcasts

Global Forest Information Service
Content on the Web site includes:
- 160 information providers around the world
- 50 new headlines every day
- Latest news
- Upcoming events
- Recent publications
- Job vacancies

You can choose your interface language and content from six options, customize your own views to global forest information and subscribe and follow GFIS RSS feeds.
www.gfis.net

IITTO-Philippines-ASEAN Rattan Project
The Web site of the IITTO (International Tropical Timber Organization)-Philippines-ASEAN Rattan Project entitled "Demonstration and Application of Production and Utilization Technologies for Rattan Sustainable Development in the ASEAN Member Countries".
www.aseanrattan.org

Newsletters/e-zines

CLIM-FO climate change and forestry
CLIM-FO-L is a monthly e-newsletter on climate change and forestry.

FOR MORE INFORMATION ON CLIM-FO-L, INCLUDING COPIES OF ALL PAST ISSUES, PLEASE VISIT:
www.fao.org/forestry/54538/en/

Headlines Himalaya
Environmental Graduates in Himalaya (EGH) brings out Headlines Himalaya every week to keep abreast with happenings in the Himalayas. If you are interested in receiving this e-news, please contact Badri Ghimire, Coordinator, EGH, Resources Himalaya, GPO Box 2448, Kathmandu, Nepal. E-mail: egh@resourceshimalaya.org; *www.resourceshimalaya.org*
(*Please see page 22 for more information.*)

Thinking beyond the canopy
Thinking beyond the canopy is a bulletin of news and commentary from the Center for International Foresty Research (CIFOR) delivered directly to your inbox. Our research spans governance, poverty and environmental issues. If you are interested in receiving this e-letter in French or Spanish, please contact: CIFOR-newsletter@cgiar.org

United Nations Convention to Combat Desertification
www.unccd.int

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* 21 is 15 May 2010.

For more information, please contact: Tina Etherington at the address on the front page or by e-mail to: non-wood-news@fao.org

Comments received

Reader from Italy
Congratulations on the quality of the bulletin.

Reader from Germany
I want to congratulate you for this issue which is special in its quality and content. So much information gathered!

I am specially impressed by the guest article by Patricia Shanley on "communication research ...". The reality is too often to be observed.

Reader from the United Kingdom
I've just received the print version of Issue 19. Congratulations on yet another fantastic bulletin, full of great articles and news items!

I'm particularly keen to read Patricia Shanley's guest article, it will be great to get her insights on communicating research results, something you and your colleagues do extremely well via *Non-Wood News*. Congratulations also to Claudia Tonini, the layout is great.

Thanks again to you and your colleagues for all the hard work that goes into producing this invaluable resource.

Reader from Canada
Thank you so much for all of the work done with *Non-wood News*, it's an incredible resource.

A library from Peru
Con continuidad nos viene llegando *Non-Wood News*, el último fue el Nº 19. Les rogamos que enviándonos continúen enviando los próximos números, pues son de gran interés, especialmente para aquellos que se dedican al campo forestal.

Reader from the Islamic Republic of Iran
I am very thankful because you posted the journal of NWFPs for me. I use it in my research. Again, I must thank you and your colleagues.

Reader from the United Kingdom
Your newsletters and digests continue to be excellent and the best way of keeping in touch with what is happening in the global NWFP world! I recommend them to all my students. Keep up the good work! ♣

EXPERIENCE AT FAO AS A VOLUNTEER

My road to FAO started in March 2009 when I was asked by my university to look for a three-month internship between August and November. Since I was already studying in Rome for a Masters in Human Development and Food Security, searching for an opportunity in FAO was an obvious choice.

The Volunteer Programme offered a perfect chance for a young student to start building up some relevant work experience, I therefore applied by sending my CV to the programme (Volunteer-Programme@fao.org), attaching a letter explaining my studies and what I could offer during my assignment. My eagerness to learn through such a relevant working environment for me such as FAO met with the Forestry Department's search for a volunteer to help contribute to its NWFP monthly digest. Two months after having applied, I was therefore selected from a list of other young candidates and swiftly proceeded to begin my assignment.

As a Masters student in Human Development and Food Security, contributing to the NWFP digest and *Non-Wood News* has been a truly enriching experience.

During the course of my studies I have learned how to assess various livelihood practices and safety nets used by vulnerable populations, all essential strategies if we want to analyse food security seriously in order to devise plans to increase people's well-being sustainably. This theoretical framework was for me a starting-point to expand on what these livelihoods constitute in practice and how they are used by vulnerable communities.

Working with NWFPs has been an excellent opportunity for me to learn how local communities use the natural resources of the forest for their livelihoods, not only for their subsistence but also as income-generating activities. These months of researching NWFPs have truly opened my eyes to a world of infinite forest resources that can be used as primary foodstuffs, medicinal remedies, ornamental and cosmetic tools, fabrics and materials for diverse equipment and many other goods.

The essential role of NWFPs will forever be part of my understanding of livelihood strategies on whatever career path I embark; for this, I have to thank all the people who helped make my stay so enlightening, especially Tina Etherington who gave me this wonderful opportunity and, even more important, introduced me to such a fascinating and relevant topic.

Agnese Bazzucchi, Volunteer, NWFP Programme

Medicinal plants and traditional medicine

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An estimated 80 percent of the world's population depend largely on traditional natural medicine. Most of these natural remedies are based on medicinal plants and herbs, with some 35 000 plant species being used.

From left to right: *Warburgia ugandensis* in a rain forest of Uganda; medicinal plant collectors returning from the forest in Nepal; processing harvested medicinal plants in India; drying *Artemisia annua* in Uganda; medicinal plant market in China (selling over 500 species of mainly wild collected medicinal plants); traditional healer in India.

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