

Care for the cure

A MAJOR obstacle to sustainable development is a social structure that gives most of a nation's wealth to a tiny minority whereas the bulk of the population, nearly 90 per cent, languishes in poverty. A person who is worrying about his next meal is not going to listen to lectures on protecting the environmental assets like forest, seas, rivers, lakes, hills and mountains. Moreover, conflicting interest between developed and developing has left the issue of protecting the forest resources unresolved. To industrial countries, forests are a treasure trove of biodiversity and greenhouse gas "sinks" that absorb CO₂ and thus keep global warming in check. To developing nations, the forests are resources ripe for exploitation: potential farm land, a free source of fuel and a storehouse of exotic kind of wood that command high price.

The world still has some virgin forests - Central Surinam Nature Reserve, Madagascar, on Himalayan foothills, New Caledonia and on the eastern slope of the Andes, and in East Africa, North East Australia and along the Atlantic Coast of Brazil - alive with wildlife. Surinam's is the least troubled rainforest, harbouring 200 known mammal species including monkeys in trees, 674 bird species, 99 amphibian species, more than 5,000 plant species, rivers, rocks, heat, darkness and a silence as deep as the forests.

Realising that it is impossible to guard every tree in every place, Mittermeier, the president of the Conservation International (CI) advocates a two-pronged strategy. One priority, based on the ideas of British Conservationist Norman Myers, is to protect the world's "hot spots" areas that are disturbed by human activity but still exceptionally rich in animal and plant species found nowhere else. The CI has identified 25 "hot spots" where preservation efforts could have maximum benefit, such as the

island of Madagascar and the Atlantic forest region of eastern Brazil. The other priority is to watch over tropical wilderness areas relatively untouched by people, including the upper Amazon region of South America and the Congo basin in Central Africa.

In both hot spots and wilderness regions, CI pushes for the demarcation of key reserves that will forever be off limits to agriculture and industry. But just as important is the nurturing of other territories where healthy forests and human enterprise can coexist. CI has a simple message for developing countries: your forests are more valuable intact and alive than they are chopped down and dead. Profits could come, for example, from the marketing of exotic foods, chemicals and medicines found only in the rain forest and from the largely untapped potential of eco-tourism. No place is wilder - or more worth saving - than Surinam, a country with only 400,000 people in a territory the size of New England.

With scientists and microbiologists scouring the globe to find - and gain profit from - organisms that could cure some of the world's worst diseases, some exciting discoveries leading to the cure for malaria is now in sight. Indian microbiologist Debaprasad Chattapadhyaya beginning his expedition in 1993 in the dense forest of the Andaman Islands found that Onge tribes in the Andaman Islands off India's eastern coast although surrounded by mosquitoes did not catch malaria. Chattapadhyaya in his quest to track down medically and scientifically useful substances in

remote areas, this time, in the dense forest of Andaman Island found some plant species that could cure malaria.

Befriending the tribe, Chattapadhyaya was led into one of the Onge's smoky, beehive-shaped huts and shown a pot containing a bitter, medicinal brew. He was given several of the plants that went into the potion. Back in his laboratory in the Andaman town of Port Blair, he came upon what he claims was a remarkable discovery: two of the plants contained anti-fever reducing properties and a third reduced the number of malarial parasites in infected human blood. Chattapadhyaya soon had a chance to test the Onge's medicine. After several jungle visits, he came down with malarial fever. He swallowed juice from the extract and was cured in three days; his fever has not resurfaced. He also asked local doctors to experiment on patients suffering from other strains of malaria, including *falciparum*, which can be fatal. Again the brew appeared to be effective on each of the seven patients treated.

Although the test group was too small to be conclusive, the findings were encouraging. A remedy for malaria might be worth hundreds of millions of dollars to a pharmaceutical company. The disease kills more than two million people a year, mainly in the sweltering latitudes of Africa, Asia and Latin America. The biologist envisioned himself becoming famous and rich by patenting the medicine. He also envisioned that some of the royalties would go to protect the Onge tribe. It was not to be. Chattapadhyaya discovered that a

superior at his government-run research centre had planned to file a patent application in his own name for the malaria cure. When the superior demanded that Chattapadhyaya reveal the plant names, he refused. Back in Port Blair, his boss, Subhash K. Saigal, launched a tirade against Chattapadhyaya dismissing the biologist's claims. He contends that the research was still at a preliminary, laboratory stage. "That young scientist got over-excited," Saigal says. Chattapadhyaya himself concedes it's possible that the Onge, like some African tribes, may possess a mutant sickle-shaped gene that provides them with immunity from malaria. But authorities won't allow him to return to the Onge's remote home to conduct any further tests.

The battle over the Onge's potion is no isolated case. Breakthroughs in computer technology, genetic engineering and other realms of biology have led to a veritable gold rush to the rain forests and mountain ranges of the tropical latitudes. It's in these spots that most of the world's plants and animals are found. Around a quarter of all prescription drugs sold in the United States are believed to be based on chemicals derived from only 40 plant species. So far, fewer than one per cent of the world's 265,000 flowering plants have been tested for their curative powers.

And so the bio-sleuths are everywhere. Encouragingly, a band of hardy researchers, equipped with laptops and backpacks filled with tools for collecting samples, are busy extracting the saliva of vampire bats from Mexico and clinically testing it for a substance that might dissolve blood clots in humans and they have patented a sacred Amazonian psychedelic brew, *ayusca* by spooning microscopic fungus from the soil in Panama. In southern India, botanists are spending time with Irla tribesmen in hopes of determining which berries and plants local medicine men use to cure cobra bites. "Taxol", a drug derived from bark found in the rain forest, has been tested as a possible preventive for several types of cancer.

Drug companies have been

methodically testing animals and medicinal plants for decades. But now, innovations in genetic research are enabling scientists to cast a far wider net - covering entire rainforests, from the largest Banyan tree to the smallest bacterium - in their search for cures. Some western countries want to exempt plants and animals from being covered by "international property rights". "But Third World countries are certain to object", says Andrew Kimbrell, director of the International Centre for Technology Assessment. Notwithstanding all such tracking efforts, Bio-pirates are notoriously hard to catch. They don't need to smuggle tons of medicinal plant out of a country, just a tiny sample so that a specimen's genetic code of DNA can be replicated in a lab. Brazilian scientists for example, are studying a frog that's used to cure intestinal diseases by the members of the Yawanwa Indian tribes on the banks of Rio Gregorio. According to anthropologists, tribesmen force the ailing person to drink a potent brew. Then they grab his arms and legs and dangle him over the edge of a precipice. Finally they place the saliva of the frog on a pointed stick and jab the stick into the patient's arm, injecting the saliva into his bloodstream. The patient begins to tremble, heaves everything in his stomach over the precipice and is cured. If a drug can be developed, future doctors can forgo the jabbing and the hanging upside down.

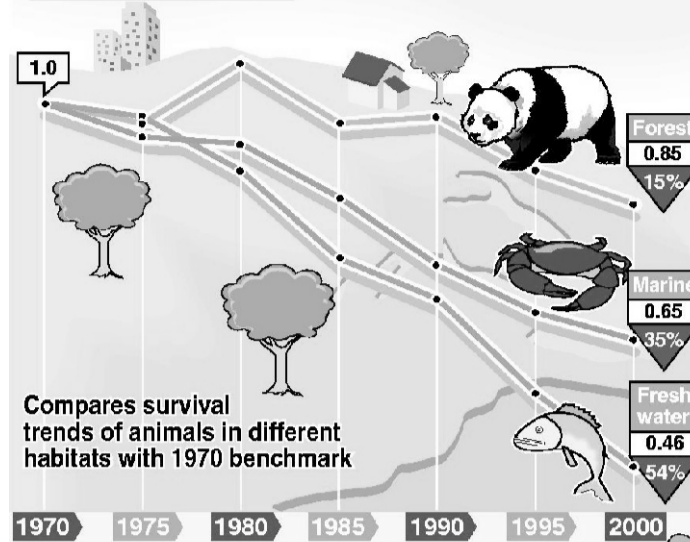
Like the Onge's bitter brew, these native concoctions can provide the first break-through in the long process toward developing a drug. Borrowing or "stealing" a tribe's lore of indigenous plants and animals can help a pharmaceutical company save years of hit-and-miss testing and millions of dollars in research. "In India we have over 5,000 tribes," says PS Ramakrishnan, an ecology professor at Delhi's Jawaharlal Nehru University. "It's impossible to find a plant species that isn't being used by one tribe or another."

In India alone, according to ecologist Vandana Shiva, the medicinal properties of at least 22 plants, which had been used traditionally to cure diseases ranging from high blood pressure to rheumatic fever,

Human impact on the world

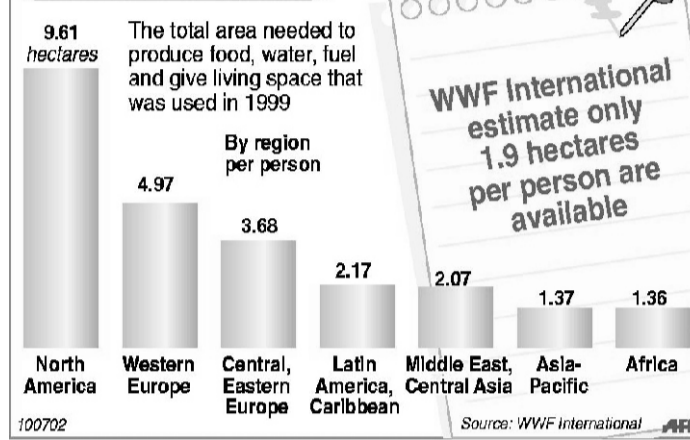
Conservation group claims that earth cannot support man's appetite for renewable resources

Living Planet Index



Compares survival trends of animals in different habitats with 1970 benchmark

Ecological Footprint



have been patented internationally by scientists and drug companies from India and abroad. Profits can be enormous. A Frenchman patented an extract made from the bark of an African Pygeum tree, which native healers had used as a cure for "old men's disease" enlargement of the prostate, an ailment common among elderly males. Throughout Africa, hundreds of tons of bark are being harvested, much of it illegally, and the tree may be on the verge of extinction. Sales of products derived from Pygeum bark amount to more than \$220 million a year.

For some activists, this is "gene imperialism," akin to the bygone exploitation of mineral deposits with scant benefit to the land's original inhabitants. The biodiversity treaty recognises that, as custodians of the biosphere, indigenous people

should receive some reward if, say, a drug company or an agribusiness firm develops a product based on traditional resources or wisdom. But according to Christoph Then of the Munich-based organisation No Patent to Life, pharmaceutical companies rarely pass on a fair share of their profits to the countries that provide the raw genetic material. While many tribesmen are reluctant to share their knowledge with outsiders, some are willing to pass on their secrets for a pittance. Kunjira Moolya, 66, is a landless labourer wandering the misty hills of southern India. He is also a medicine man who, for free, will use the herbs and plants of the rain forest to try to cure snake bites, asthma and epilepsy.

The Kani tribes living in Kerala, otherwise called rainforest dweller,

inherit a vast trove of healing art for many complicated diseases. All these healing potions have been collected from the rain forest of Kerala. One of their medicinal discoveries has been developed as an energy powder by a team of Indian scientists, who have agreed to pay the tribe a portion of royalties they receive from commercial drug companies. It all began around 10 years ago when two tribesmen, Mullan Kani and Kutty Mathan Kani were hired as guides for botanists from the Trivandrum-based Tropical Botanic Garden and Research Institute (TBGRI) on a research trip in the coastal hills. The trek was arduous - the hills are known for their glutinous leeches - and the exhausted scientists kept pausing for breath. Their guides, though, were unfazed by the exertions. Asked why, the tribesmen produced a stash of pale-green berries and offered them around. "I felt a sudden flush of energy and strength," recalls S. Rajasekharan, an ethnomedicine expert. He and his colleagues decided to check the plant for its medicinal properties.

Initially, the Kanis were reluctant to identify the plant because of traditional taboos on sharing tribal secrets. But the biologists eventually persuaded them to do so, arguing that the imparted knowledge would help thousands of unhappy and ill people. Local people eventually identified the plant as Aarogyappacha, a previously unknown subspecies of the variety "Trichopus zeylanicus," a type of shrub that grows only in the hills of Kerala. Chemical and pharmacological tests proved that the fruit has anti-fatigue properties. In 1996, after eight years of research, the TBGRI produced a drug called "Jeevani" ("life source" in Sanskrit) which is said to reduce stress and exhaustion. An Indian pharmaceutical company paid the institute \$25,000 for the formula and agreed to hand over five per cent of all future sales.

Sadly enough, forest wealth especially plant and animal species of South Indian forests and the Sunderbans in Bangladesh are yet to be investigated for its potential use in human ailment. Encouragingly, in a survey conducted recently under the auspices of the Asian Development Bank) an expert committee has catalogued about 334 varieties of plant species, 373 varieties of wildlife and 186 varieties of birds in the mangrove forest Sunderbans. The new approach to biodiversity uniting conservation and economic development must be practised.

Double death

Asia's demand for live fish is severely depleting fish stocks, causing destruction of reefs

AFP, Rarotonga, Cook Islands

CONSERVATION officials attending an environment meeting here say demand for live reef fish in Hong Kong and other Asian markets is increasing, while Asian sources of fish are declining as a result of over-fishing.

Cristina Balboa of the Washington-based World Resources Institute told the Pacific Ocean Sciences Fellowship here the volume of live fish taken by foreign fishing companies for sale in Asia has risen rapidly since the mid-1990s.

While Asian countries are estimated to consume up to 50,000 tons of live fish a year, the ornamental fish export trade for aquariums is also growing exponentially, Balboa said.

In 1971, just 200 species of ornamental fish were imported into the US. Two years ago, the number had jumped to 1,038 species, she said.

Throughout the Philippines and Indonesia cyanide poison has been used by fishermen because it is a quick and easy way to collect the targeted fish, which include groupers, coral trout and the humphead wrasse that command up to 40 dollars per pound in Hong Kong.

But cyanide use is destructive, leaving dead fish and coral in its wake, said The Nature Conservancy's Paul Lokani, who is based in Papua New Guinea.

The Marshall Islands and Palau are the only two Micronesia-area

nations where cyanide use has been confirmed, Lokani said. Palau has now banned live reef fishing, but it continues in the Marshall Islands.

Since 1997, several atolls in the Marshall Islands are known to have cut deals with foreign fishermen involved in the live reef food fish trade.

"Live reef food fish operators have been sporadically active in the Federated States of Micronesia, Fiji, Kiribati, Marshall Islands, Palau, and Papua New Guinea and have also been eyeing Vanuatu and Tonga," said the Hawaii-based International MarineLife Alliance vice president Charles Barber.

"Some of these operators have failed, due in part to the relatively high costs of transport to the main markets in China, but others, such as the fishery in the Marshall Islands, are very active. And when one operator fails, another appears."

To overcome the costs of the distance that fishermen have to travel to deliver their product from distant Pacific islands, the live reef fishermen must fill their holds with catches in excess of 9,000 kilograms (20,000 pounds).

This level of fishing in a small atoll can severely deplete fish stocks available for local consumption, say conservation officials.

The reality is that without adequate monitoring and supervision, there is no incentive for the foreign fishing vessels to develop sustainable fishing operations in the Mar-

shall Islands and other countries, they say.

Barber said some companies have resorted to attempting to hide the source of their live reef fish catches in the Pacific - a fisheries version of money laundering because of the growing criticism over fishing methods and unsustainability of the fishery.

Two years ago, 45 per cent of the total live reef fish catch was reported as originating in Singapore, an area that has no reefs or significant fishery.

This may have to do with the size of the catch now being produced in order to meet the Hong Kong and Chinese market demand for live fish.

In 1997, an estimated 25 million fish with an average weight of slightly over two pounds each were exported to Asia, a large percentage coming from the Pacific.

"On the one hand, the live reef food fish trade is potentially a sustainable, low-volume, high-value fishery with significant potential to boost incomes in the Pacific Islands - if it is well-managed," said Barber.

"On the other hand, it has been an unsustainable and destructive fishery as practised throughout much of Southeast Asia, and similar destructive practices have been documented in a number of Pacific Island nations."

Seeds of distrust

GE cover-up derails Kiwi PM's election campaign

AFP, Auckland

NEW Zealand's lacklustre election campaign exploded on July 10 with claims in a new book that the country had suffered accidental release of genetically engineered (GE) sweetcorn and that the government of Prime Minister Helen Clark covered it up.

Genetics has been the major issue with Clark's Labour Government, which has said it would allow a moratorium on GE crops to lapse next year while the Green Party says if that happened it would bring the government down.

"Seeds of Distrust: The story of a GE cover-up" by Nicky Hager alleges that in November 2000, GE contaminated crops were released into New Zealand and have been allowed to grow and be processed for consumption.

Clark responded angrily to Hager's allegation.

"It is an outrage, these conspiracy theories," she said adding she was frustrated that GE was debated emotionally rather than factually. "There are none so deaf as those who don't want to hear it, of course."

Environment Minister Marian Hobbs was adamant she was not aware of any seeds from the shipment having been planted.

"There is no proof that there are (GE) contaminated plants planted - okay? There is no proof. If there were proof that there were, they would have been (pulled) out."

This is the second blow to Clark in recent days.

On Friday police said there was a prima facie case for laying criminal charges over signing a painting she did not do but because it was for charity they would not press charges. They revealed Clark's staff had destroyed the evidence, and had not been completely cooperative with the police.

Clark threatened the media with defamation suits if they published comments about it made by Opposition Leader Bill English.

Hager, a left-wing researcher, rose to prominence with a book outlining the extent of the Echelon spy network - involving the United States, Canada, Britain, Australia and New Zealand, a quasi alliance dating to World War II. It led to a European Parliament inquiry.

His publisher, Craig Potton, is a Green Party candidate but Greens leader Jeannette Fitzsimons said she knew nothing of the book until Wednesday and was feeling "shell-shocked".

English said Clark should explain why her government had tried to "cover up its incompetence instead of explaining to the public what happened..."

"It looks like a pattern of behaviour... first she makes the wrong decision and then sets out to cover it up."

This one is one the public do regard as significant."

Hager said the government was told in November 2000 that a 5.6-tonne consignment of sweetcorn seeds from the US company Novartis Seeds (now Syngenta) had been found to be contaminated with GE sweetcorn seeds.

But by the time Clark and Hobbs were told, thousands of GE sweetcorn plants were already growing across the country, Hager said.

The release of New Zealand-grown GE-contaminated sweetcorn has not been previously disclosed.

He alleged government officials prepared a special regulation, to give necessary powers to order

destruction of the crops, but at a later point the crops were left to grow and approval was given for the rest of the seed to be planted.

At least five tonnes of GM corn - the equivalent of 100,000 cans - was processed as part of the much larger harvest of conventional corn.

In one case the corn was grown next door to an organic farm.

Hager said a similar incident occurred in Austria but there the crop was pulled up and destroyed.

Instead, the government implemented rules that seed imports could be 0.5 per cent GE contaminated and the corn crop was allowed to grow, be harvested and sold.