

Economics of ecology

AN increasing global population is fuelling the demand for more and better food. Experts say that farmers will need to at least double their production over the next 25 years to feed the new mouths. Annual yield increases have slowed down. This means agricultural and wilderness areas will be under intense pressure. Environmental experts fear that up to half the world's six billion acres of tropical forests will be lost to agricultural expansion. And biologists warn that as many as 20 per cent of all species in these forests will be extinct within 30 years and two out of three people could live in water stressed conditions by 2025.

Wilderness areas are critical for protecting biodiversity. Tropical rainforests alone, which cover six per cent of the planet's land area, are home to more than half of all known species. Many wild regions suffer from human encroachment and species are vanishing at a rate not seen since the demise of dinosaurs. But all is not lost, at least not yet. Even as Harvard Biologist Wilson and others warn of an impending Armageddon, conservation groups and scientists are devising innovative strategies for preserving broad swaths of rain-forest, grassland, tundra and coral reef before they are swallowed by the global village.

With six billion people crowding the planet at the present moment and still increasing, the world is too crowded to fence off wilderness areas and ignore the impact on human livelihood. Communities must be able to prosper alongside wilderness without encroaching on it. The future of conservation can better be spelt through "zoning". At least this is the idea held by Eric Dinerstein, chief scientist for the World Wildlife Fund, US. "We cannot stop development, nor should we. The most we can do is have it in places where it does the least damage," he said. People, especially conservationists, are achieving success bit by bit.

In the Cardamoms (Cambodia), hunting caused the most damage. Under an agreement with the Cambodian government, Conservation International pays for

Conservation groups and scientists around the world are devising innovative strategies to reap economic benefit out of environment conservation, writes Md. Asadullah Khan

about 200 rangers to patrol the area to stop poachers and prevent illegal logging. The group is also establishing agricultural and health projects to help local people replace lost income. In exchange for this long-term commitment, the Cambodian government in August last declared a half-million hectares of the Cardamoms off limits to logging, cancelling six concessions that had been promised to foreign timber companies. "But efforts like these will succeed only when there is constant on-the-ground monitoring," environmental groups say.

Protecting wilderness is a difficult job. Since each region is unique, strategies have to account for local conditions, says Alan Robinowitz, director, science and exploration at the Wildlife Conservation Society, based at the Bronx Zoo in New York. Robinowitz helped set up a jaguar reserve in Belize and a national park in Burma. In Hkhabubo Razi National Park in northern Burma, he discovered that locals were hunting wildlife, particularly red pandas and leaf-deer in greater number than were needed for food. People were swapping the skins with Chinese traders for salt, which does not

occur naturally in the area. So Robinowitz instituted a salt distribution programme. At a cost less than \$5,000 a year, the 3,000 people in the park now get enough salt to make hunting for barter unnecessary.

The fact is that we cannot expect those living in poverty and ignorance to worry about saving the world or protecting its wilderness. Some ideas that environmentalists like Thomas Love Joy in 1984 had about forgiving the poor countries' debt if developing countries gave protected status to some valuable wild area in their region wonderfully worked. Conservation International implemented the first debt-for-nature swap in Bolivia's Beni Biosphere reserve in 1987. The US Congress gave the strategy a boost, which authorised the president to reduce some country's debt in exchange for forest protection.

In June last, the US working with three environmental groups exempted \$5.5 million of Peru's foreign debt. In exchange, Peru will extend protection to 11 million hectares of tropical rainforest containing pink river dolphins, jaguars, scarlet macaws, and giant

water lilies. The non-governmental organisations (NGOs) have been entrusted with the job of monitoring to ensure that regulations are enforced. Ecotourism has become a major source of income in many developing countries. Reserves and surrounding land are being recognised to create an outer buffer zone where local people are helped to develop sustainable agriculture enveloping an inviolate core zone to the maximum protection of endangered species. Programme for Belize, a non-profit group has bought 105,000 hectares of forest in north western Belize - about four per cent of the country's total land area - that had been destined for logging. Half of the area is now a reserve - surrounded by a buffer zone in which forestry and tourism are permitted. Ecotourism covers some 60 per cent of the reserve's management costs. Saba Marine Park in the Netherlands and Chitwan National Park in Nepal have similar programmes.

Similar approach could be taken to protect the Sunderbans, a world heritage site, from poaching and illegal logging. The single largest tract of mangrove forest is now

under heavy assault from poachers and loggers, who work in connivance with some corrupt forest officials. The trend in the last decade reveals that outside the Sunderbans, only tiny patches of forests remain and worryingly, these are under severe fragmentation pressure. In a bid to save the remaining wilderness areas, some strategies undertaken in Peru or the Netherlands can be tried out in our country.

The Sunderbans aside, some beautiful spots in Sunamganj, Moulvibazar, Kaptai, Rangamati and Cox's Bazaar with its varied wild life, flora and fauna are not yet developed fully for ecotourism attraction. With attractive tour packages, decent accommodation facilities, convenient travel facilities ensuring safety of the tourists both from home and abroad, the country has immense prospect to earn substantial revenue and foreign exchange. Ensuring safety of the tourists while they are deep inside the country away from human habitation can make such projects viable. Because the visitors want to lose themselves in the wilderness, in the solitude of hills, mountains, rivers and forests isolated from human habitation. They would visit the country to see such beautiful spots with natural bounties when their safety and security have been guaranteed.

ENVIRONMENT WATCH

Malaria milestone

Scientists unravel genetic map of one of humanity's greatest scourge

AFP, Paris

Scientists announced on October 2 they had unravelled the genetic map of the mosquito and the malaria parasite, creating a weapon that may have the potential to eradicate one of humanity's greatest scourges.

Their six-year effort may yield dazzling new drugs, smart repellents and vaccines that, it is hoped, will not only stop malaria in its tracks but also attack other fatal mosquito-borne diseases.

Malaria is a plague in dozens of poor tropical countries, reaping an annual harvest of more than a million lives and leaving hundreds of millions sick, the overwhelming majority of them infants in sub-Saharan Africa.

The scientists set their sights on sequencing the DNA makeup of the blood-sucking mosquito *Anopheles gambiae*, which transmits the microscopic parasite to humans via its saliva, and of the most lethal parasite,

Plasmodium falciparum.

"The genomes of these two organisms, along with that of the human, provide a triad of critical genetic information relevant to all stages of the malaria transmission cycle," an editorial declared in the US weekly Science, which publishes the research in next Friday's issue.

"They offer unprecedented opportunities to the scientific and public health communities engaged in the fight against malaria, a disease that exerts a huge toll on humanity."

Doctors say genomics, the study of the inherited code, throws up the most exciting tool to combat disease since the advent of antibiotics more than 60 years ago.

A genome comprises the map of the DNA coils, or chromosomes, which provide the chemical recipe for making and sustaining an organism -- the creature's "book of life," holding the secrets to all its strengths and weaknesses.

The mosquito genome, whose code has been sequenced by a team led by Robert Holt of the US biotech giant Celera Genomics Inc., is about twice that of a distant relative, *Drosophila melanogaster*, a fruitfly that is the basis for biotech research on insects.