

Preserving Biodiversity

The Web of Life

"We can marvel at the colours of a butterfly, the grace of a giraffe, the power of an elephant, the delicate structure of a diatom. Every time a species goes extinct, we are irreversibly impoverished"
—Norman Myers, (1986).

Biological diversity—or biodiversity—is the term given to the variety of life on Earth and the natural patterns it forms. The biodiversity we see today is the fruit of billions of years of evolution, shaped by natural processes and, increasingly, by the influence of humans. It forms the web of life of which we are an integral part and upon which we so fully depend.

Biological diversity is often understood at three levels:

- species diversity refers to the variety of different species (plants, animals, fungi and micro-organisms) such as palm trees, elephants or bacteria;
- genetic diversity corresponds to the variety of genes contained in plants, animals, fungi and micro-organisms. It occurs within a species as well as between species. For example, poodles, German shepherds and golden retrievers are all dogs, but they all look different;
- ecosystem diversity refers to all the

different habitats—or places—that exist, like tropical or temperate forests, hot and cold deserts, wetlands, rivers, mountains, coral reefs, etc. Each ecosystem corresponds to a series of complex relationships between biotic (living) components such as plants and animals and abiotic (non-living) components which include sunlight, air, water, minerals and nutrients.

Biodiversity at each of these levels of complexity is characterised by: *Variety*, the number of different types; *Quantity*, the number or total biomass of any type; and *Distribution*, the extent and nature of geographic spread of different types.

Biodiversity is not only the sum of all ecosystems, species and genetic materials; it represents the variability within and among them. It can be distinguished from the expression "biological resources", which refer to the tangible components of ecosystems. Biological resources are real entities

(a particular species of bird, a wheat variety growing in a field, oak wood, etc.), while biological diversity is rather an attribute of life (the variety of bird species, the genetic variability of wheat around the world, forest types, etc.).

Where is Biodiversity?

Biodiversity is essentially everywhere, ubiquitous on Earth's surface and in every drop of its bodies of water. This diversity of the planet is often understood in terms of Taxonomic diversity, the wide variety of plants, animals and microorganisms, and is the best known dimension of biodiversity.

Biodiversity essentially exists in the biosphere. The biosphere is that part of planet earth's outer shell within which life occurs, and in which biotic processes in turn alter or transform. From the broadest geophysiological point of view, the biosphere is the global ecological system integrat-

WHAT CAN I DO ABOUT BIODIVERSITY?

While governments should play a leadership role, other sectors of society need to be actively involved. After all, it is the choices and actions of billions of individuals that will determine whether or not biodiversity is conserved.

One of the most important things that we can do to conserve biodiversity is to get involved—in our roles as parents, community members, educators, landowners, voters, employees, employers, politicians, and business leaders.

Local communities play a key role since they are the true “managers” of the ecosystems in which they live and, thus, have a major impact on them. Many projects have been successfully developed in recent years involving the participation of local communities in the sustainable management of biodiversity, often with the valuable assistance of NGOs and intergovernmental organizations.

Finally, the ultimate decision-maker for biodiversity is the individual citizen. The small choices that individuals make add up to a large impact because it is personal consumption that drives development, which in turn uses and pollutes nature. By carefully choosing the products you buy, you begin to steer the world towards sustainable development.

Obedying the laws already in existence are a good way to start. By developing strong personal ethics you avoid the use of articles made of animal products like fur, skins, horns, nails, hair, shell, ivory, scents like musk and civet, etc.

Learn about your place in your community—where your water comes from, how your food gets to your table, where and how your clothing is made. Is our wood from sustainable forestry and our newspaper recycled? Do we use chemicals in our home or garden which are toxic to wildlife? Do we design parts of our gardens for the benefit of wildlife? Does your pattern of expenditure reflect the seriousness of your commitment to caring for the living world. By understanding how your daily actions and lifestyle choices can affect global biodiversity, you can take the first steps toward conserving it.

The most important task is to spread awareness of conservation and conservation efforts. Be aware of the various groups and organizations involved in the conservation of wildlife. Support their efforts and if possible volunteer your services, by writing letters to elected officials, lobbying on biodiversity issues, raising money for environmental and social organizations, educating fellow employees, conducting workshops on consumer issues, and forming community stewardship councils.



ing all living beings and their relationships, including their interaction with the elements of the lithosphere (rocks), hydrosphere (water), and atmosphere (air). Biosphere is a very thin surface layer, which goes down to 11000 meters of depth, to rising up to 15000 meters of altitude, although the majority of life lives in the zone located between -100 meters and +100 meters. Biosphere and biodiversity are inseparable characteristics of the Earth. The sphere is the container, whereas diversity is the contents.

Current trends in biodiversity loss

The rich biodiversity that has always characterized the natural world is today declining. The extinctions or threatened

extinctions of many species are the most visible and well-known manifestation of biodiversity loss. Declines in the numbers of such charismatic animals as pandas, tigers, elephants, whales, and various species of birds, have drawn world attention to the problem of species at risk.

While the loss of individual species catches our attention, it is the fragmentation, degradation and outright loss of forests, wetlands, coral reefs, and other ecosystems that poses the gravest threat to biological diversity. Here it should be recalled that biodiversity loss is not just extinction, such as that faced by many threatened and endangered species; declines in genetic, ecosystem and landscape diversity are also considered bio-diversity loss.

The rich tapestry of life on our

planet is the outcome of over 3.5 billion years of evolutionary history. Several times in the past (approximately five) extinctions occurred on vast scales, with the majority of life forms dying out. These extinction events seem to have been the result of forces, such as shifts of the continental plates, to the impact of meteorites and volcanic activity, and ice ages, to interaction among species.

Now, scientists believe that, we are in midst of the sixth great wave—the sixth mass extinction to affect life on Earth. And we, humans, seem to be causing it. We were not here for any of the previous mass extinctions, but this time, the rapid growth of human population, has emerged as the most obvious reason why there is less room for any other species. As result of human activity, ecosystems

"Goods and Services" provided by ecosystems include:

- Provision of food, fuel and fibre.
- Provision of shelter and building materials.
- Purification of air and water.
- Detoxification and decomposition of wastes.
- Stabilization and moderation of the Earth's climate.
- Moderation of floods, droughts, temperature extremes and the forces of wind.
- Generation and renewal of soil fertility, including nutrient cycling.
- Pollination of plants, including many crops.
- Control of pests and diseases.
- Maintenance of genetic resources as key inputs to crop varieties and livestock breeds, medicines, and other products.
- Cultural and aesthetic benefits.
- Ability to adapt to change.



are being fragmented or eliminated, and innumerable species are in decline or already extinct. We are creating the greatest extinction crisis since the natural disaster that wiped out the dinosaurs 65 million years ago. These extinctions are irreversible and, given our dependence on food crops, medicines and other biological resources, pose a threat to our own well-being.

What has previously been caused by plate tectonics, volcanoes, meteors, and other forces of nature is now being caused by the depletion of resources and rapid destruction of habitats. One-third to one-half of the world's terrestrial surface, where wildlife live, has now been substantially altered by human activity, such as urbanization. Our settlement patterns are changing our relationship with the environment. Nearly half the world's people live in towns and cities. For many people, nature seems remote from their everyday lives. More and more people associate food with stores, rather than with their natural source.

From the dawn of agriculture, some 10,000 years ago, through the Industrial Revolution of the past three centuries, we have reshaped

our landscapes on an ever-larger and lasting scale. We have moved from hacking down trees with stone tools to literally moving mountains to mine the Earth's resources. Old ways of harvesting are being replaced by more intensive technologies, often without controls to prevent over-harvesting. For example, fisheries that have fed communities for centuries have been depleted in a few years by huge, sonar-guided ships using nets big enough to swallow a dozen jumbo jets at a time. The world's fish stocks have been reduced by an astonishing 90 per cent since the start of industrial fishing. By consuming ever more of nature's resources, we have gained more abundant food and better shelter, sanitation, and health care, but these gains are often accompanied by increasing environmental degradation, that may be followed by declines in local economies and the societies they supported.

This view has been reinforced by the UN Millennium Ecosystem Assessment (MA), the most comprehensive audit to date, of the health of our planet. Entitled *Ecosystems and Human Well-being: Biodiversity Synthesis Report*, its key finding is that in the last 50 years, human actions

have changed the diversity of life on the planet more than at any other time in history. Our activities have lifted many people out of poverty, but at the price of a loss of biodiversity. If we continue down this road, we will reduce biological diversity, with life-threatening consequences, for all, including human beings.

The world's most comprehensive inventory of the conservation status of plant and animal species, IUCN Red List of Threatened Species for 2004, maintained by the International Union for Conservation of Nature and Natural Resources reveals that, a total of 15,589 species face extinction—some 12 per cent of birds, 23 per cent of mammals, 25 per cent of conifers and 32 per cent of amphibians are threatened with extinction.

While the status of vertebrates is relatively well documented, we know little about non-terrestrial systems (freshwater and marine), or many species-rich habitats (such as tropical forest or the ocean depths), or species-rich groups such as invertebrates, plants and fungi (which together compose the overwhelming majority of species). Ninety per cent of species, maybe more, have not even been catalogued by science yet.

So far, about 1.7-2 million species have been identified, but scientists reckon that there are actually about 13 million species, though estimates range from 3 to 100 million. It is impossible to know how many species of invertebrates and micro-organisms have been already lost or are being lost.

Forests are home to much of the known terrestrial biodiversity, but about 45 per cent of the Earth's original forests are gone, cleared mostly during the past century. Despite some

Saving the Tiger



The case of tiger has grabbed headlines in the media. The tiger's domain ranges over most of the Indian subcontinent. The tiger is at home in a variety of environmental situation from the high altitude, cold, coniferous Himalayan forests to the steaming mangroves of Sundarbans delta, swampy reedlands of the terai, the lush wet evergreen forests of north-east and the south and the scrub-thorn arid forests of Rajasthan. The Tiger is the best indicator species of an ecosystem. It is the ultimate consumer in the complex food web in many of the forest ecosystems of India. Among the terminal carnivorous animals of an ecosystem, the tiger stands at the head. Conservation of tiger in its natural environment can be achieved only by total conservation of the wilderness based on an ecosystem approach. That is the reason why it is stated that the status of tiger in India is the index of success, as a whole, in the conservation of wildlife.

INDIA: A LAND OF DIVERSITY ... AND DESTRUCTION

Ecosystems	Range Native to India	Destroyed/Under Threat
Forests	200 types, scrub to rainforest	Approximate 50 per cent wiped out over last century
Wetlands	8 types, seasonal flood plains to lakes	One-third drained out, 70 per cent polluted
Coasts	Several types of beach, mangroves, coral reef systems	40 per cent of mangroves wiped out; major portion of coral reefs bleached or silted

Source: Folio, The Hindu, May 20, 2001

re-growth, the world's total forests are still shrinking rapidly, particularly in the tropics. Up to 10 per cent of coral reefs—among the richest ecosystems—have been destroyed, and one-third of the remainder face collapse over the next 10 to 20 years. Coastal mangroves, a vital nursery habitat for countless species, are also vulnerable, with half already gone. Some ecosystems, such as tall-grass prairies and tropical dry forests, have almost entirely disappeared.

Even the loss of a single species is a tragedy, because each form of life is a storehouse of irreplaceable genetic resources. Extinction is an irreversible process and when a species becomes extinct it sets off a cascade of extinctions.

From the dawn of time, extinction has usually progressed at what scientists call a natural or background rate. While biodiversity loss has been a natural part of the history of Earth, it has always been countered by origination and, except for rare events, has occurred at extremely slow rates. Currently, however, loss far exceeds origination, and rates are orders of magnitude higher than average rates in the past, and the pace of extinction has accelerated dramatically. According to the MA report, organisms are disappearing at something like 100 to 1,000 times the "background levels" seen in the fossil record.

Another difference, between earlier extinctions and the one many scientists say we're facing today, is that the potential for species and ecosystems to recover from this episode of extinction is probably far lower than with past episodes. Research of long term trends in the fossil record sug-

gests that natural speed limits constrain how quickly biodiversity can rebound after waves of extinction. Hence, the rapid extinction rates mean that it could take a long time for nature to recover.

And when you look to the future, to various projections and scenarios, we expect those changes to continue and in some circumstances to accelerate. Future models are very uncertain, but all of them tell us that as we move into the next 100 years, we'll be seeing extinction rates that are a thousand to 10,000 times those in the fossil record.

Biodiversity and food chain

The building blocks of plants, animals and humans are identical, and are made up of the four elements: carbon, oxygen, nitrogen and hydrogen. These elements are available in the environment in the air, water and soil. However, only green plants can absorb nitrogen from the soil through their roots, and use sunlight and water, by a process called photosynthesis, to produce energy. They are known as producers. Animals and humans get their food only by consuming plants or other animals. Therefore, they are known as consumers. The chain that links consumers to producers is called the food chain. Every living creature is to be found on a food chain. There are several food chains and depending on the environment it can be complex or simple. Consider a very short and simple food chain in water. Green algae are eaten by water fleas, which

Challenges

Some of the major challenges to implementing the Convention on Biological Diversity and promoting sustainable development are:

- Meeting the increasing demand for biological resources caused by population growth and increased consumption, while considering the long-term consequences of our actions.
- Increasing our capacity to document and understand biodiversity, its value, and threats to it.
- Building adequate expertise and experience in biodiversity planning.
- Improving policies, legislation, guidelines, and fiscal measures for regulating the use of biodiversity.
- Adopting incentives to promote more sustainable forms of biodiversity use.
- Promoting trade rules and practices that foster sustainable use of biodiversity.
- Strengthening coordination within governments, and between governments and stakeholders.
- Securing adequate financial resources for conservation and sustainable use, from both national and international sources.
- Making better use of technology.
- Building political support for the changes necessary to ensure biodiversity conservation and sustainable use.
- Improving education and public awareness about the value of biodiversity.



are in turn eaten by hydras. An example of a slightly longer chain is, plankton-krill-small fish-predator fish-seal-man.

All food chains are fragile. If a link in the chain is broken, it sets off a series of reactions. If snakes are destroyed, the population of rats and moles would increase dramatically and they would devour crops and grains at an alarming rate. If the predator animals are hunted down, the grazing animals multiply in large numbers, and will eat up all the green grass, leaving the land barren and unproductive.

Thus the importance of each and every creature in the web of life is evident. Tampering with the food chain only produces negative results, leading to the destruction of species. This shows why biodiversity and all its components are essential to maintain

the balance of nature. Man is only a strand in the delicate web of relationship in the global ecosystem. Every time a species becomes extinct, the strand is broken and man himself moves closer to his doom.

Biodiversity conservation

Up until fairly recently, protection of biodiversity focused almost exclusively on the species itself. Habitat protection originally had little to do with species protection. Trying to save species individually is not very effective or very efficient. Protecting the habitat of these species makes much more sense, as there is little chance of them going extinct in their natural environment.

In 1972, the United Nations Con-

ference on the Human Environment (Stockholm) resolved to establish the United Nations Environment Programme (UNEP). Governments signed many agreements to tackle specific issues, such as protecting wetlands and regulating the international trade in endangered species. Later, some efforts were made to preserve key ecosystems through the adoption of protective measures, and the survival of many endangered species was ensured in zoos and botanical gardens. However, these are stopgap actions. The long-term viability of species and ecosystems depends on their being free to evolve in natural conditions. This means that humans have to learn how to use biological resources in a way that minimizes their depletion.

The challenge is to find economic policies that motivate conservation



and sustainable use by creating financial incentives for those who would otherwise over-use or damage the resource. Some of the world's richest areas in terms of biodiversity lie in developing countries, which must balance protection of their natural resources with the need to clothe and feed their populations. Efforts to achieve sustainability must address not only the conservation of biodiversity and other natural resources, but also issues of economic security and social equity.

To address the issue of conservation and sustainable use, the UN World Commission on Environment and Development (WCED), in a landmark publication entitled "Our Common Future", released in 1987, said that: "Humanity has the ability to make development sustainable—to ensure that it meets needs of the present without compromising the ability of future generations to meet their own needs." It also pointed out that for "sustainable development" to be achieved there is a need to integrate environmental considerations into economic programmes. The WCED brought to the public domain the critical issues of biodiversity loss and conservation, which had for a long time been confined almost exclusively to scientific and technical discussions.

The first and a landmark global agreement on the conservation and sustainable use of biological diversity, the Convention on Biological

Diversity (CBD), was adopted in 1992, at the Earth Summit, at United Nations Conference on Environment and Development in Rio de Janeiro, Brazil.

The Convention recognizes, for the first time, that the conservation of biological diversity is "a common concern of humankind" and is an integral part of the development process. The agreement covers all ecosystems, species, and genetic resources. Conserving the ecosystem is to conserve each and every component in it and conserving a species requires the conservation of its habitat or the ecosystem it is used to.

The Convention reminds decision-makers that natural resources are not infinite and sets out a new philosophy for the 21st century, that of sustainable use. While past conservation efforts were aimed at protecting particular species and habitats, the Convention recognizes that ecosystems, species and genes must be used for the benefit of humans. However, this should be done in a way and at a rate that does not lead to the long-term decline of biological diversity.

The Convention also offers decision-makers' guidance based on the precautionary principle that where there is a threat of significant reduction or loss of biological diversity, lack of full scientific certainty should not be used as a reason for postponing measures to avoid or minimize such a threat.

The treaty commitments include: Developing national biodiversity strategies and action plans, and to integrate these into broader national plans for environment and development. This is particularly important for such sectors as forestry, agriculture, fisheries, energy, transportation and urban planning.

Key issues and approaches

Halting the process of degradation and species loss requires specialized solutions and an understanding of ecological processes. Protecting biodiversity does not merely involve setting aside chunks of area as reserves. Instead, all the ecological processes that have maintained the area's biodiversity, such as predation, pollination, parasitism, seed dispersal and herbivory, involving complex interactions between several species of plants and animal, needs to be ensured. This, however, is possible only if reserves are large enough to maintain these processes and some of the other crucial links in the web of life.

As of now, there are still major lacunae in information resources pertaining to forests, biodiversity—flora and fauna, causative factors for their degradation, and major threats. The available data is alarmingly inadequate to provide a lucid picture of the current status and ongoing

losses/gains.

Attempts to tackle biodiversity loss politically are unlikely to succeed unless they fully take into account the direct and indirect causes of the crisis, *viz.* the growth of the human population; patterns of consumption; global trade; economic systems and policies that fail to value the environment; pollution, over exploitation, global climate change and inequity in ownership; and the flow of benefits from the use and conservation of biological resources.

The traditional approach has been preservation—setting aside large tracts as preserves and parks, and reserves to protect and rehabilitate wildlife. This approach, though, is costly and displaces indigenous peoples who have lived on the land for centuries. A long-term solution, many conservationists believe, is to protect wildlife and ecosystems in ways that benefits the inhabitants.

One of the major challenges to conservation is to set priorities. There are limited resources available, human and financial, so conservationists are attempting to establish effective strategies for targeting international efforts. One approach, originally suggested by biologist Norman Myers, is to focus efforts on protecting the world's hot spots, or species-rich areas that are most in danger.

India's rich biodiversity

Biodiversity is not evenly distributed among the world's countries. A very small number of countries, lying wholly

or partly within the tropics, contain a high percentage of the world's species. Species richness or diversity is high in the tropics and the cold depths of the oceans, as both these regions are somewhat protected from disturbances due to inaccessibility.

India accounts for 7-8 per cent of the earth's total biodiversity. India is also one of the 18 mega diverse countries, which together possess 60-70 per cent of the world's biodiversity. The 18 mega diverse countries are: Brazil, China, India, Zaire, Indonesia, Colombia, Mexico, Ecuador, Kenya, Peru, Congo and the Madagascar.

India owes its richness in biodiversity to its position in the tropical and subtropical latitudes. India has a great diversity of natural ecosystems from the cold and high Himalayan ranges to the seacoasts, from the wet northeastern green forests to the dry northwestern arid deserts, different types of forests, wetlands, islands, estuaries and oceans. Every ecosystem has its own unique representation of species. India also possesses islands like the Andaman and Nicobar and Lakshadweep, with their own endemic species, and mountain ranges like the Himalayas and the Western and Eastern Ghats.

Some salient features of India's biodiversity have been mentioned below:

India has two major realms called the Palaearctic and the Indo-Malayan, and three biomass, namely the tropical humid forests, the tropical dry/deciduous forests, and the warm desert/semi-deserts.

India has ten biogeographic

regions, including the Trans-Himalayan, the Himalayan, the Indian desert, the semi-arid zone(s), the Western Ghats, the Deccan Peninsula, the Gangetic Plain, North-East India, and the islands and coasts.

The endemism of Indian biodiversity is high. About 33% of the country's recorded flora are endemic to the country and are concentrated mainly in the North-East, Western Ghats, North-West Himalaya and the Andaman and Nicobar islands. About 62% of the known amphibian species are endemic with the majority occurring in the Western Ghats. Nearly 50% of the lizards of India are endemic with a high degree of endemism in the Western Ghats. India is a centre of crop diversity—the homeland of 167 cultivated species and 320 wild relatives of crop plants.

According to the Red List of Threatened species (IUCN, 2000), 44 plant species are critically endangered, 113 endangered and 87 vulnerable. Amongst animals, 18 are critically endangered, 54 endangered and 143 are vulnerable. Ten species are Lower Risk conservation dependent, while 99 are Lower Risk near threatened. India ranks second in terms of the number of threatened mammals, while India is sixth in terms of countries with the most threatened birds (IUCN, 2000). Some species under threat in India include: Hornbill, Pariah kite and White-backed vulture, The Lesser Florican, Hoolock Gibbon—the only ape of India—Tiger, Asian or Indian Elephant, Asiatic Lion.



Biodiversity conservation in India

India has a rich tradition of biodiversity conservation. Traditional human relationships like beliefs, faith, taboos, customs and preferences played an important role in conservation of habitats and individual species. The 'sacred groves', and 'sacred lakes' established by local communities in several parts of India predate the modern concepts. The cultural ethos of the Indian people is amply demonstrated by such conservation efforts. In a majority of Indian villages, trees have been planted and dedicated to different Gods/Goddesses or have been declared as abode of spirits, making them sacred.

A large number of forest preservation plots, several being more than ninety years old, established by the forest department in representative forest types of India and covering 85,000 ha, could play a major role in biodiversity conservation and detection of change.

Formal policies and programmes for conservation and sustainable utilisation of biodiversity resources date back to several decades. The concept of environmental protection is enshrined in the Indian Constitution in Articles 48a and 51a(g). Major Central Acts relevant to biodiversity are: Indian Forest Act, 1927; Wildlife (Protection) Act, 1972; Forest (Conservation) Act, 1980; Environment (Protection) Act, 1986. The various Central Acts are supported by a number of State laws and statutes concerning forests and other natural resources.

Approximately 4.3% (against 10% internationally) of the total geographical area of India has been earmarked for extensive in situ conservation of habitats and ecosystems. Till 2002, a protected area network of 89 National Parks and 496 Wildlife Sanctuaries has been created.

Twelve biodiversity rich areas of the country have been designated as Biosphere Reserves, applying the UNESCO/MAB criteria. These reserves aim at conserving the biological diversity and genetic integrity of

plants, animals and microorganisms in their totality, as part of the natural ecosystems, so as to ensure their self-perpetuation and unhindered evolution of the living resources.

Programmes have also been launched for scientific management and wise use of wetlands, mangroves, and coral reef ecosystems. Mangroves conservation has been identified as one of the thrust areas of the Ministry of Environment and Forests.

India has launched programmes like Project Tiger and Project Elephant, which, though focused on a single species, have a wider impact as they conserve habitats and a variety of other species in those habitats. The Tura Range in Garo Hills of Meghalaya is a gene sanctuary for preserving the rich native diversity of wild Citrus and Musa species. Sanctuaries for rhododendrons and orchids have been established in Sikkim.

A number of gene banks, including the National Bureau of Plant Genetic Resources (NBPGR), the National Bureau of Fish Genetic Resources have been set up.

Among the signatories to the CBD, India is one of the first few countries to have enacted an appropriate comprehensive legislation to achieve the objectives of the convention.

Despite, some reservations, great strides have been made in biodiversity conservation, but there is still a need for further steps. Future efforts for conservation and management of our natural resources must derive from a set of clear objectives, mechanisms for action, and commitment from all stakeholders.

Financial resources pose a severe constraint on efficient conservation of forests and biodiversity. The potential of the private sector has also not been tapped effectively. Detailed policies and strategies are required for fragile and important ecosystems such as wetlands, grasslands, seas and oceans, as well as corridor and buffer areas, since the emphasis is often overly on forests.

More importantly, laws and poli-

cies governing natural resources are still not sufficient enough to tackle the scale of the problem, and these insufficiencies have not been addressed with a sense of urgency.

Implementation and enforcement of the legislation in existence is often poor. The initial success of Project Tiger was eroded by an increased demand for some body parts of a tiger, especially bones, leading to the involvement of illegal traffickers. Poaching continues to be a very major threat, even though a very detailed action plan for combating it is already in place.

Biological Diversity and its underlying concepts can be difficult to communicate to politicians and to the general public, it remains an issue that few people understand. This also needs to be addressed.

Biodiversity protection and sustainability requires redefining their policies on land use, agriculture, forestry, fisheries, tourism, energy, development, conservation, economics, and trade. The challenge facing governments, businesses, and citizens is to forge transition strategies leading to long-term sustainable development. It means negotiating trade-offs even as people are clamouring for more land and businesses are pressing for concessions to expand their harvests.

Finally, innovative mechanisms for financing biodiversity conservation need to be devised, including tapping the potential of the private sector and earmarking at least one per cent of State and Central government resources for biodiversity. Such initiatives will reinforce the initiatives taken by the government towards conserving the rich and unique biodiversity of the country.

