

Business, Finance & Economy

Shrinking eco-systems will slow economic growth

The earth's eco-systems are life-creating natural networks; they deliver irreplaceable goods and services - temper the climate, purify and store water, recycle wastes, produce food and support all other things that make earth a habitable place. Human progress has throughout history been based on the utilization of the earth's eco-systems for agriculture and industry. These eco-systems seem to be capable of meeting the requirements of the 6 billion people on the earth at present, but we are consuming natural resources so rapidly that fears are expressed that we may not leave much to future generations. It is estimated that the world's population would be between 7.3 and 10.7 billion by 2050 and their demand for food, heat, shelter and other consumption goods would result in greater utilization of natural resources. Has the earth the capacity to nurture the full diversity of life and the economies of the nations in the new millennium?

This crucial question has been studied by 175 scientists from many disciplines under the auspices of the UN agencies - the World Bank, the UNDP, the UN Environment Programme and the World Resources Institute - and the first report of their findings: "People and Eco-systems: The Fraying Web of Life" paints a rather gloomy picture. This exhaustive and the most ambitious in recent times - study has assessed five major eco-systems: fresh water, coastal and marine habitats, forests, grasslands and agricultural lands and concluded that all the eco-systems are strained to the limit and their capacities are beginning to diminish, threatening our economic well-being and ultimately our survival. The report looks at how people have altered eco-systems and affected their robustness and where trouble might be in the future; it focuses attention on the profligacy of the 20th century which had led humanity into the bottleneck of overpopulation and shrinking natural resources.

Fresh Water

As all organisms need it to survive, water is perhaps the most crucial eco-system. Human water consumption has risen sixfold in the past century or double the rate of population growth. About 54 per cent of the available fresh water is now being used by the people and additional demand is likely to jeopardize all other eco-systems. It is feared that water scarcity may limit economic development, particularly in the developing countries where supplies are already insufficient to meet the needs of people, agriculture and industry. Based on new data and analysis, the UN report asserts that 2.3 billion people face water shortages, 60 per cent more than in previous estimates. River water is used so much for economic and social needs that some rivers such as Colorado, Yellow, Nile and Ganges dry up sometimes before reaching the sea and ground water is being depleted almost everywhere. This is made worse by the draining of half the world's wetlands thereby destroying habitat

and the killing of lakes and poisoning of rivers by the flow of fertilizers, silts, sewage and other effluents.

The introduction of non-native species into an environment tends to disrupt the existing balance. The introduction of Zebra mussels from the Caspian Sea into the Great Lakes, for instance, has clogged water supply systems. The introduction of the Nile perch and tilapia into Africa's Lake Victoria has crowded out 350 species of native cichlid fish that used to support the local fishermen - most of whom are too poor to afford the equipment necessary to fish for perch. The reduction of cichlid population by more than 80 per cent has resulted in widespread malnutrition in the surrounding villages. The disappearance of cichlids

has had an unexpected ecological effect: without the movements up and down of cichlids and mixing the water, some layers of the lake have become stratified and depleted of oxygen. The resultant algal blooms, fed further by pollution and agricultural run off are now threatening the perch and tilapia fishery. The UN report estimates that 20 per cent of fresh water species have vanished or been driven towards extinction in recent decades.

We are wasting water without thinking of the consequences. Americans for instance, use 1.4 trillion liters of fresh water everyday and of this, 18 billion litres or 4.8 billion gallons are used merely to flush toilets. On the other hand, there are 290 million Africans who do not have access to safe drinking water. Besides, the quality of water has decreased in the past 20 years.

Coastal and Marine Habitats

Coastal areas containing about 2 billion people play a vital role in the economy of a country. Two-thirds of all fish harvested depend at some point in their life on coastal wetlands, sea grasses or coral reefs, which are fast disappearing. The destruction of mangroves on tropical coastlines by shrimp farmers in many countries such as Thailand and Ecuador tend to destroy the fish nurtured in mangroves, depriving offshore fishermen of their livelihood. Shrimp farms foul the water, destroy mangroves and marshes and serve as breeding grounds for fish diseases. Toxic pollutants (from agriculture, industry, cities and logging) carried by rivers to the sea have produced a rash of algal blooms that rob oxygen from water - creating oceanic dead zones where fish cannot live. Coral reefs are threatened by warming water and human activity; the latter has imperilled 58 per cent of the

world's coral reefs. Further, man-made climatic changes threaten all coastal areas as melting glaciers and warming and expanding oceans cause sea levels to rise flooding coastal areas and submerging small islands. Productive parts of the sea floor are being destroyed by the scouring of trawlers. The situation is compounded by over-fishing; fishing fleets are 40 per cent larger than the oceans can sustain; the catch is declining for about one-third of major commercial fish and overfishing has depleted

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major populations of cod, swordfish, tuna, snapper, grouper and sharks.

Collapsing fisheries will hurt about one billion people particularly in South East Asia. The collapse of the North Atlantic cod fishery has put 30,000 Canadians out of work.

Agricultural Lands

Global food production has doubled and livestock production tripled since 1970 but the trade-offs are depleted, polluted water supplies, exhausted soils and destroyed habitats. One-third of the global land has been converted to food production but three-fourths of this area has poor soil. Food production has so far outpaced population growth but the future is uncertain with loss of agricultural land to urban development, soil degradation and water

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scarcity. More than 40 per cent of the agricultural land is badly degraded due to improper farming causing nutrient loss, erosion and water stress. As pointed out earlier, humans already use 54 per cent of earth's rainfall but 70 per cent of that goes to agriculture. Irrigated agriculture provides 40 per cent of the world's food but intensive irrigation taxes aquifers and drains rivers causing salt build up in soil. River water is considered more mineralized than rainfall and desert rivers like Tigris and Colorado are especially salty. Irrigating a crop-land can leave several tons of salt dispersed in the soils. There are 7 million acres of salt-burdened land in India, 6 million in China and 4 million in Pakistan. Some analysts believe that more land has gone out of production because of salt than has come into production through irrigation in some countries like Russia. Fertilizers and pesticides used on large scale

in agriculture kill not only pests but also helpful creatures, taint groundwater and create dead zones in lakes and the ocean.

Big dams across rivers for controlling the supply of water or for diversion of water for irrigation are responsible for some of the worst environmental tragedies of recent times. The diversion of Amu Darya and Syr Darya for cotton cultivation in Uzbekistan by Kruschev has caused the shrinking of the Aral Sea to less than half its former size since the 1960s and destroyed one of the world's richest inland fisheries. Dams across Columbia River in the US have destroyed salmon fishery in the American North West. The 10 million to 20 million adult salmon which swim upriver

from the ocean to spawn in an ordinary year are now prevented from making the journey to the ancestral spawning habitat by the river dams. Dams across the Mississippi are preventing the river from dumping 18 billion truckloads of sediment at the Gulf of Mexico and laying new land or adding to old land.

As humans use already more than half the available fresh water on earth and two-thirds of all agricultural land is damaged to some degree, the challenge before us is to how to feed the 1.5 billion to 2.0 billion people expected to join the global population within the next two decades.

Grasslands and Forests

Grasslands cover about 40 per cent of the world's land - Savannas, Shrublands and Tundra - and support the largest mammals, migrating birds, crops and livestock. Most human food grains originated in grasslands and wild strains of these grains help keep crops resistant to threats. Large areas of grasslands are being turned into farmland or used for urban development. About 80 per cent of them are affected by deteriorating soil. The US has lost almost all of its original grassland. Elsewhere soil erosion and desertification are reducing their ability to support livestock. It is an alarming fact that 20 per cent of drylands in the world are in danger of becoming deserts.

Forests are home to two-thirds of all species; they temper climate, capture and store water, store 40 per cent of terrestrial carbon and slow the build up of carbon dioxide in the atmosphere and provide timber needed for economic development. Forests, however, are shrinking as a result of a largescale logging, clearing and burning for agricultural and human settlement; 60 per cent of the world's rain forests have been lost to agriculture and

timber. As forests vanish, so do animals, herbal medicines and biodiversity. Deforestation which releases carbon from trees, accounts for 20 per cent of human caused carbon emissions that spur climate change; deforestation on mountains worsens floods in the plains below as illustrated by the recent experience of China and Madagascar. The destruction of forests has resulted in 976 tree species being classified as critically endangered. If the current rate of habitat destruction were to continue in forests and coral reefs alone, half the species of plants and animals would be gone by the end of the 21st century.

Carbon and Nitrogen Cycles

Our pumping of carbon dioxide into the atmosphere - by burning of coal, oil and gas - line for heat, electricity and transportation - much faster than land and seas can absorb it and accumulating it has trapped heat and upset the climate, for instance global warming, rising seas and fiercer storms. It may also result in the shifting of boundaries of forests and grasslands causing difficulties of adjustment to animal and plant species. The US is the world's largest emitter of greenhouse gases and has special responsibility to lead the effort to tackle global warming. Our use of fertilizers, the burning of fossil fuels and land clearing have doubled the levels of nitrogen compounds that can be used by living beings. As these levels are more than can be efficiently absorbed by plants and animals and recycled into the atmosphere, they wash into fresh and salt water systems, stimulating growth of algae and dead zones. As the global food system is based on aggressive use of fertilizer, restoring the nitrogen cycle poses a challenge.

The UN report emphasizes that the Earth is one big natural system and that torching tropical rain forests and destroying coral reefs will eventually threaten the well-being of people everywhere. The inescapable fact is that economies cannot remain forever healthy in an unhealthy environment. Ecosystems are naturally resilient but human action is reducing their ability to bounce back. Halting the decline in the earth's life-supporting systems is the most difficult challenge humanity has ever faced. The report specifies some common-sense measures which governments can adopt; e.g. abolition of subsidies on pesticides, chemical fertilizer and water; among other necessary measures are population control, recycling, cleaner cars, organic food, the rescue of endangered species, water saving nozzles, low-flow toilets and shower heads, less-thirsty landscaping, water conservation, use of wind power, solar energy, environmental education, environmental regulations, ecotourism, greenhouses and offices and the building of sustainable communities. Environmentalism needs to move from being a philosophy of a passionate minority to a way of life that governs our behaviour and policy.