# Climate Change: Are South Asia's ecosystems at the brink of extinction?

**December 2, 2009** – South Asia is endowed with an exceptional array of biodiversity. Its vast geography spans several diverse ecosystems, from the mountains of the Himalaya-Hindu Kush, to the Thar Desert, and the coral reefs and atolls of Maldives. The United Nations Environment Programme (UNEP 2001) notes that the regions' ecosystems occupy about 3.6% of the world's area but contain 16% and 12% respectively of the floral and faunal species found in the world .

"But today *South Asia's natural resources face tremendous pressure from rapid population growth,"* said **Richard Damania***,* World Bank Lead Environmental Economist for the South Asia Region speaking ahead of the United Nations Climate Change Conference **in Copenhagen, Denmark** from December 7 to 18, 2009. *"In addition, rapid economic expansion has led to unsustainable extraction of natural resources and accelerating levels of air and water pollution*."

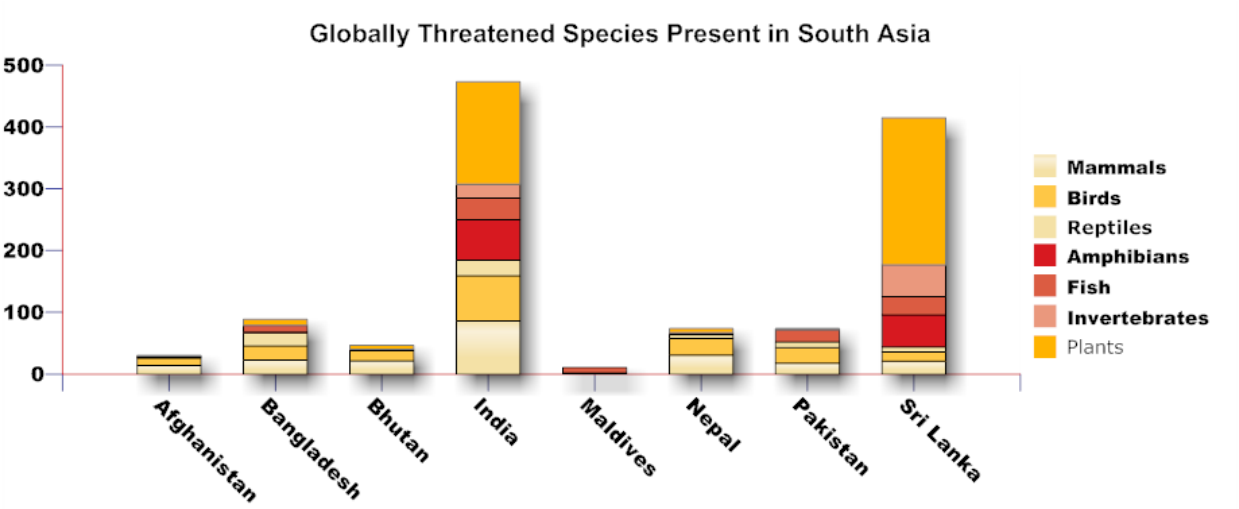
**Contributions of Ecosystems**

It is seldom recognized, nor adequately acknowledged that the region's ecosystems underpin the economic fortunes of its poorest and most vulnerable people. Poverty through much of Siuth Asia has retreated to the rural hinterland and has become deeply intertwinned with resource degradation.

The region's ecosystems support critical life-sustaining services (through soil formation, nutrient cycling, primary production, oxygen production, and habitats) and regulate processes crucial to well-being (air quality, climate, water flow, soil retention, water purification, and biological and disease control). Yet 10–30% of the region's faunal species are currently under threat of extinction.

"*Biodiversity has been crucial in ensuring food security, nutrition, access to water, good health, and the environmental sustainability of the region*," said **Damania**. "*Appropriate management of natural systems can therefore play a critical role in the development choices of the region* "

**Conservation Status**




**Impacts of Climate Change**

Climate change and biodiversity are closely linked and each impacts the other. Biodiversity is threatened by human-induced climate change, but biodiversity reduces the impact of climate change. The presence of healthy biodiversity builds natural resilience to climate extremes: as an example, forests are nature's social security check in times of disaster and crisis; additionally forests also act as a sink for harmful greenhouse gas emissions.

"The loss of iconic species like the tiger are highly visible if we choose to look," said **Damania**. "But *there are more subtle impacts of degradation as ecosystems lose their ability to perform sequestration. This could aggravate the impacts of climate change.*

This degradation can be managed and reduced through adaptive and mitigation strategies. This calls for a greater investment in protecting and enhancing ecosystem services, managing habitats for endangered species, creating refuges and buffer zones, and establishing networks of terrestrial, freshwater and marine protected areas that take into account projected changes in climate.

**Risks to grazing, mountains and forests**

Forests account for about 20–30 % of the total land area of India, Nepal, and Sri Lanka and about 68% in Bhutan. Savannas and dry forests are grazing areas for the region's large population of livestock, which is essential to food security and agricultural draught. Climate change will affect the vegetation, productivity, and biodiversity of these ecosystems.

While climate change could improve forest productivity in the short to medium term, the resulting transformation of vegetation systems is likely to result in a loss of biodiversity and productivity as critical thresholds are reached.

The 2007 IPCC Fourth Assessment Report projects that carbon fertilization may likely lead to net primary productivity gains in the short and medium term with the gains experienced in some forest types outweighing the losses in others. Some vegetation types are likely shift to higher elevations as a result of global warming. Some vegetation types may disappear in the process, together with dependent species and ecosystems.

**Challenges facing marine ecosystems and coastal communities**

Coral reefs are not unlike tropical rainforests in biodiversity and are important sources of tourism revenue. Along with mangroves they also protect coastal areas against erosion, sedimentation, floods, and storm surges. "*Climate change will alter these ecosystems through changes in hydrology, sea level, sea temperature, and water chemistry*," said **Damania.**

The irreversible losses to biodiversity would adversely impact economic opportunities in coastal communities. Coral coverage in the Indian Ocean islands and South Asia combined has declined from more than 40% in 1997 to just over 20% in 2002. This is translating into losses to fisheries, mangrove ecosystem productivity, and tourism.

**Future Directions**

**Damania** stressed that the impact of climate change on ecosystems and biodiversity is a key development concern to be integrated into development programs and responses to climate change. He cautioned though that there were significant gaps in knowledge about these systems and the impact of changes within them. "Making good development choices *now requires a considerable investment in knowledge building*."

Also critical would be vastly expanding the protected area networks that have been heavily degraded and fragmented in much of South Asia.

So how does this agenda attract funding? **Damania** said donor development giants and funding for climate change adaptation are some obvious source but market-based instruments and the revenue-generating value of biodiversity itself are of full of potential.