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Tuesday, May 22, 2012

## **Mountains and oceans: sustaining life on earth**

By Sunita Chaudhary

Since 1993, International Day for Biological Diversity has been observed on May 22 to create awareness about conservation of biodiversity, its sustainable use and fair and equitable sharing of the benefits that come from the utilisation of genetic resources. This year, the conservation community's decision to focus on marine biodiversity as a theme for the day has given me an opportunity to reflect on the inherent, yet often overlooked, bond between mountains and oceans.

An anonymous author once said that mountains and oceans together make the Earth. Neither can conquer, nor exist in isolation from the other. Mountains encompass spectacular landscapes and are host to a great diversity of species, a wide variety of terrestrial ecosystems, and distinctive human communities. Oceans cover 70 percent of the planet's surface area with diverse habitats are inhabited by a variety of creatures and are among the last sources of wild food on the planet. Binding these two unique biomes together is the water cycle, providing the platform for life on earth.

Though in some cases, like in the Himalayas, they can seem worlds apart, mountains and oceans are inherently interconnected. Rivers in particular — flowing from sources thousands of metres above sea level, through various ecosystems and agricultural plains, to deltas and estuaries before joining the ocean — explicitly connect the two, creating lifelines that provide food, water, transportation, and recreation along the way. Another simple illustration of this connection is the annual path of migratory birds that brave a course from the mountains to the ocean and back each year in order to breed and survive. Their epic flights draw a clear line connecting mountains and oceans, making us realise the importance of protecting both entities to sustain life on earth.

Mountains and oceans both provide important services that keep the world livable. While the ice stored at the peaks of the world's mountains play a critical role in regulating the global climate, ocean life produces a third of the oxygen that we breathe, which is also critical in moderating global climatic changes. Regarded as water towers of the world, mountains fulfil the freshwater needs of more than half of humanity. Likewise, oceans offer a valuable source of food, providing nutrition to more than 2.6 billion people.

When talking about the interconnected nature of ecosystems from the apex of the highest mountain to the depths of the deepest ocean, upstream and downstream linkages cannot go unmentioned. These ecological linkages are exemplified in the circulation of nutrients sourced upstream, such as nitrogen, phosphorus and silicon, which are filtered through rivers or other channels to ensure a healthy and productive marine ecosystem downstream. Similarly, it is important to reiterate the hydrological links between water systems — between mountains and oceans, and upstream and downstream — which provide ecosystem goods and services to humanity. For example, the uplift of the Himalayas and the Tibetan Plateau is thought to significantly affect the Indian monsoon system. The monsoon, in turn, can determine major changes in the flora, fauna, and productivity of lands upstream as well as downstream. We should therefore think of the impact that actions taken upstream will have downstream, extending all the way to the ocean. It is extremely important to take actions wisely in order to sustain ecosystem goods and services for the benefit of all.

Born in the shadows of the Himalayas in Nepal, I have been fascinated by the beauty of the mountains since my childhood. After I was taught the connection between oceans and mountains in Grade 5, I longed to see and feel the ocean for myself.